(12) UK Patent Application (19) GB (11) 2 225 811 (13) A

(43) Date of A publication 13.06.1990

(21) Application No 8828629.9

(22) Date of filing 08.12.1988

(71) Applicant
David John Price
104 Pennant Rd, Swiss Valley, Llanelli, Dyfed, SA14 8HN, United Kingdom

(72) Inventor
David John Price

(74) Agent and/or Address for Service
David John Price
104 Pennant Rd, Swiss Valley, Llanelli, Dyfed, SA14 8HN, United Kingdom

(51) INT CL[5]
F03B 13/14, F01K 27/00, F03D 3/06 // F03D 7/06

(52) UK CL (Edition K)
F1S S28B1
F1Q QDD Q115 Q119 Q214 Q219 Q311 Q314 Q511 Q519
F1T TC T102 T121 T134 T149 T311

(56) Documents cited
GB 2064665 A **GB 2008686 A** **GB 1515744 A**
GB 0277007 A **GB 0250209 A** **GB 0197002 A**

(58) Field of search
UK CL (Edition J) F1S

(54) Device for converting sea and wind energy to rotary power

(57) The device comprises a framework mounted on piles and supporting a plurality of floats connected to arms 13 for transmitting motion due to wave action to an output shaft by means of ratchet devices. A wind driven rotor 35 having pivotable vanes 37 is also provided and contributes to the power output of the device. A water level sensor unit, comprising a float, is also provided and a mechanism associated therewith enables the framework to be raised or lowered in response to changes in water level. Details are given of the gearing, couplings, bearings and shafting necessary for transmitting drive through the device, for controlling the vanes 37 of the wind driven rotor, and for adjusting the height of the framework. The device is constructed in sections, details of which are also given.

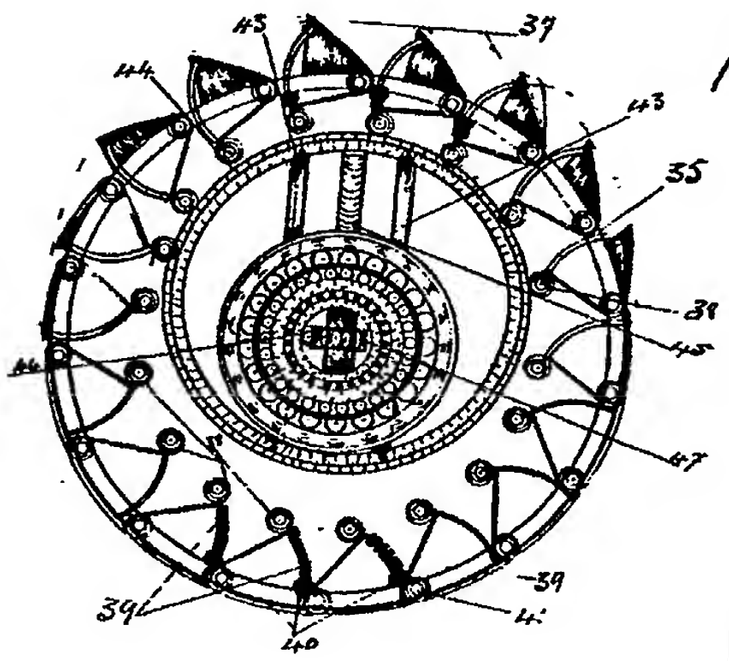


Fig: 14

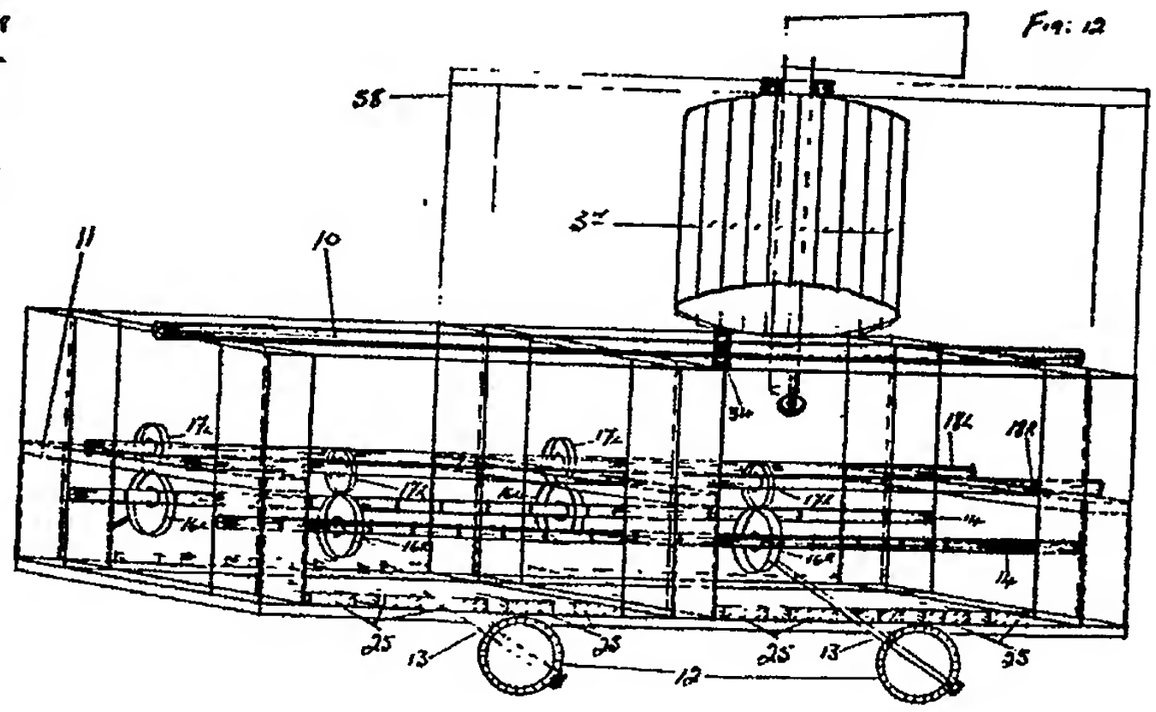
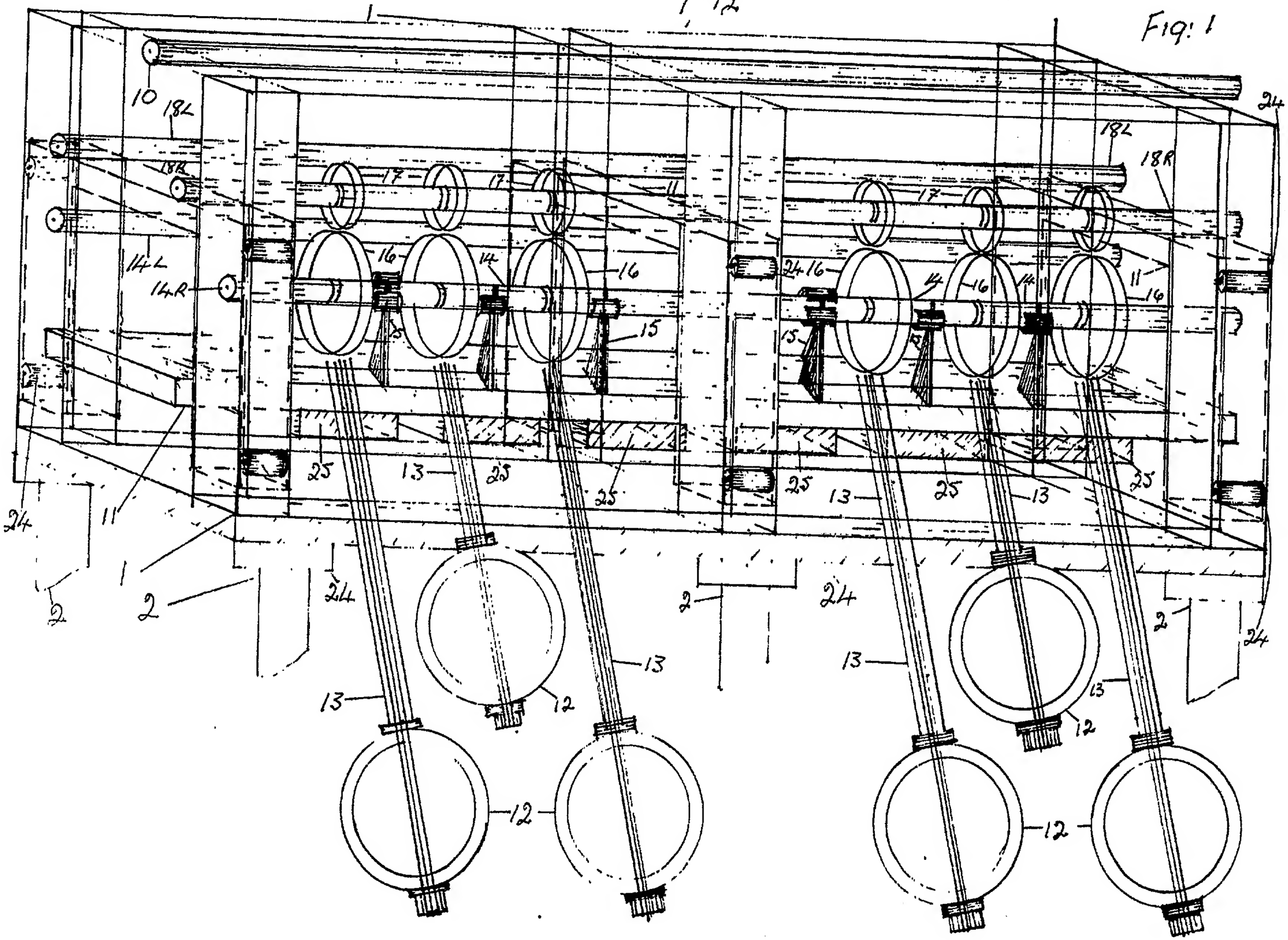


Fig: 12

GB 2 225 811 A

1/12

Fig: 1



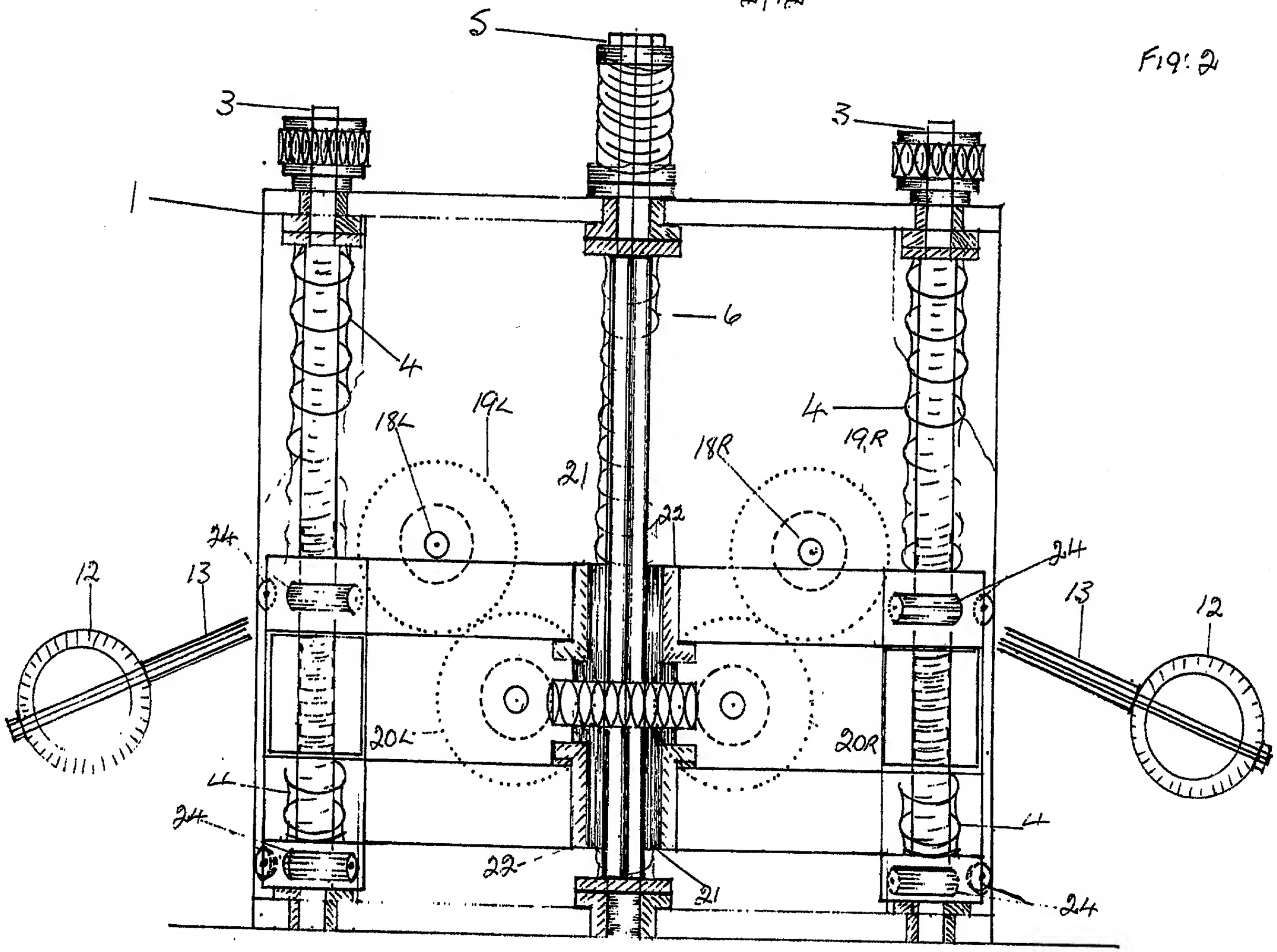

5
3
3
1
6
4
4
18L
19L
18R
19R
21
22
24
24
12
13
13
12
20L
20R
11
11
24
22
21
24

Fig: 2

Fig: 3

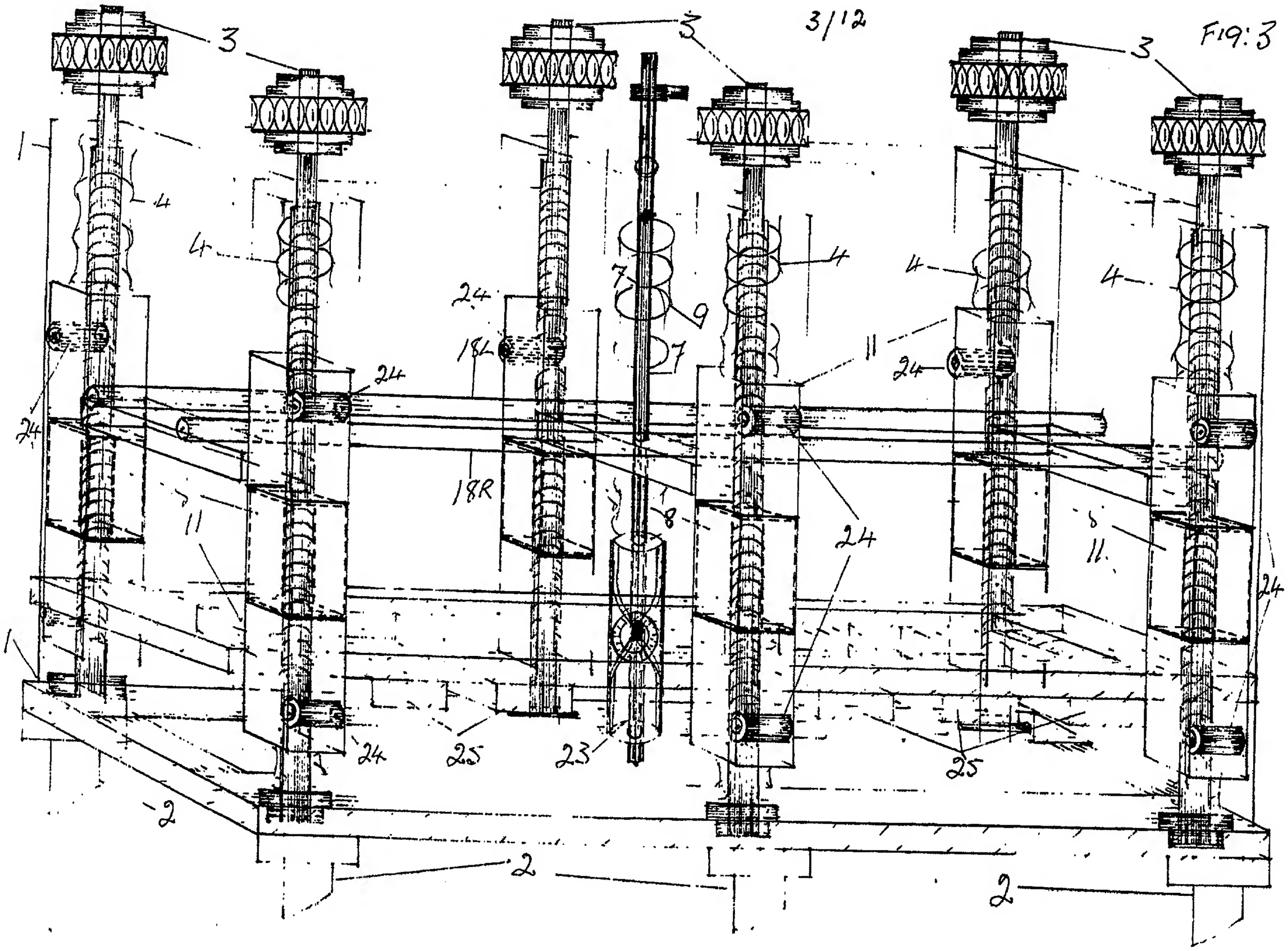


Fig 4

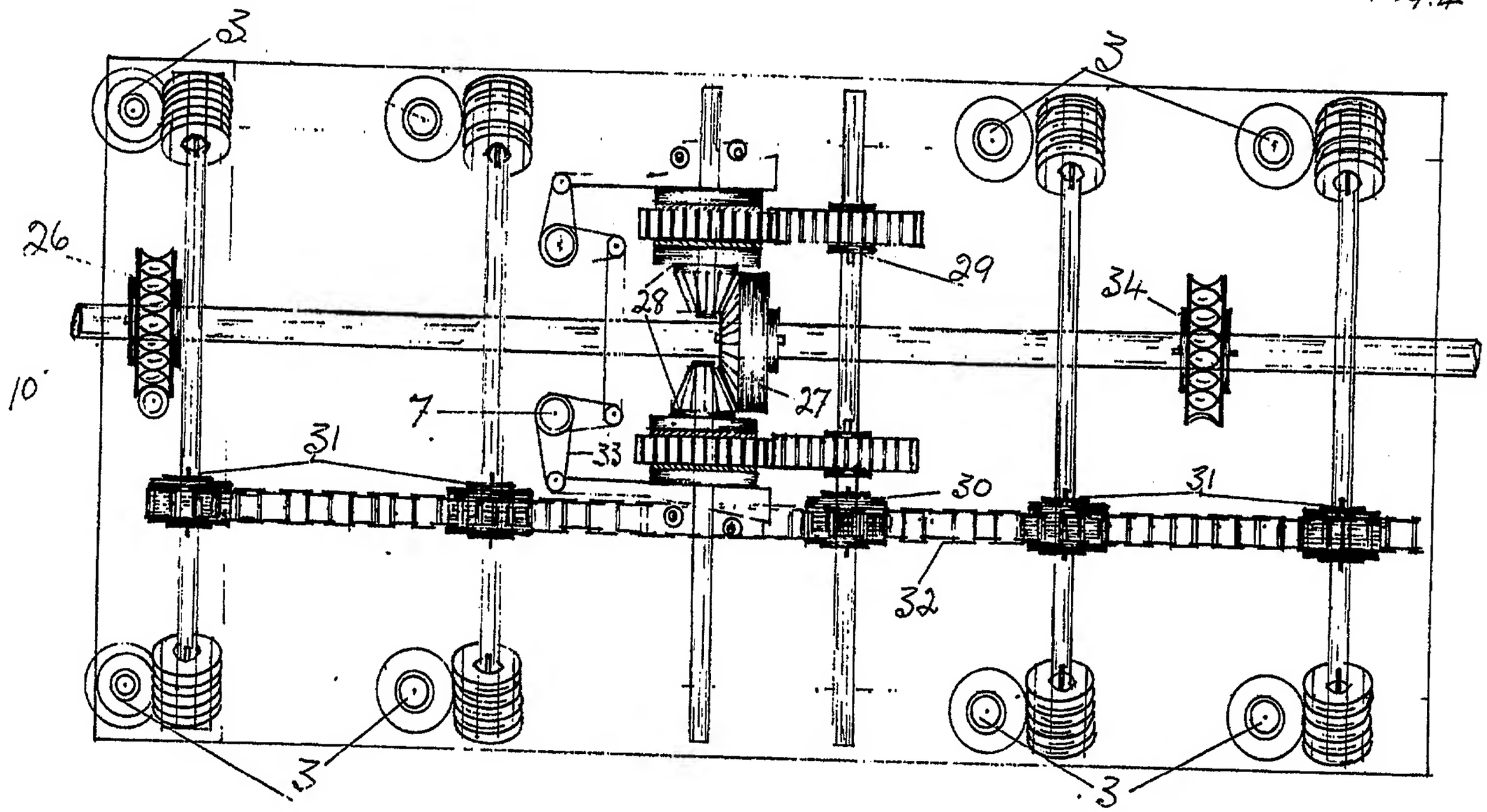
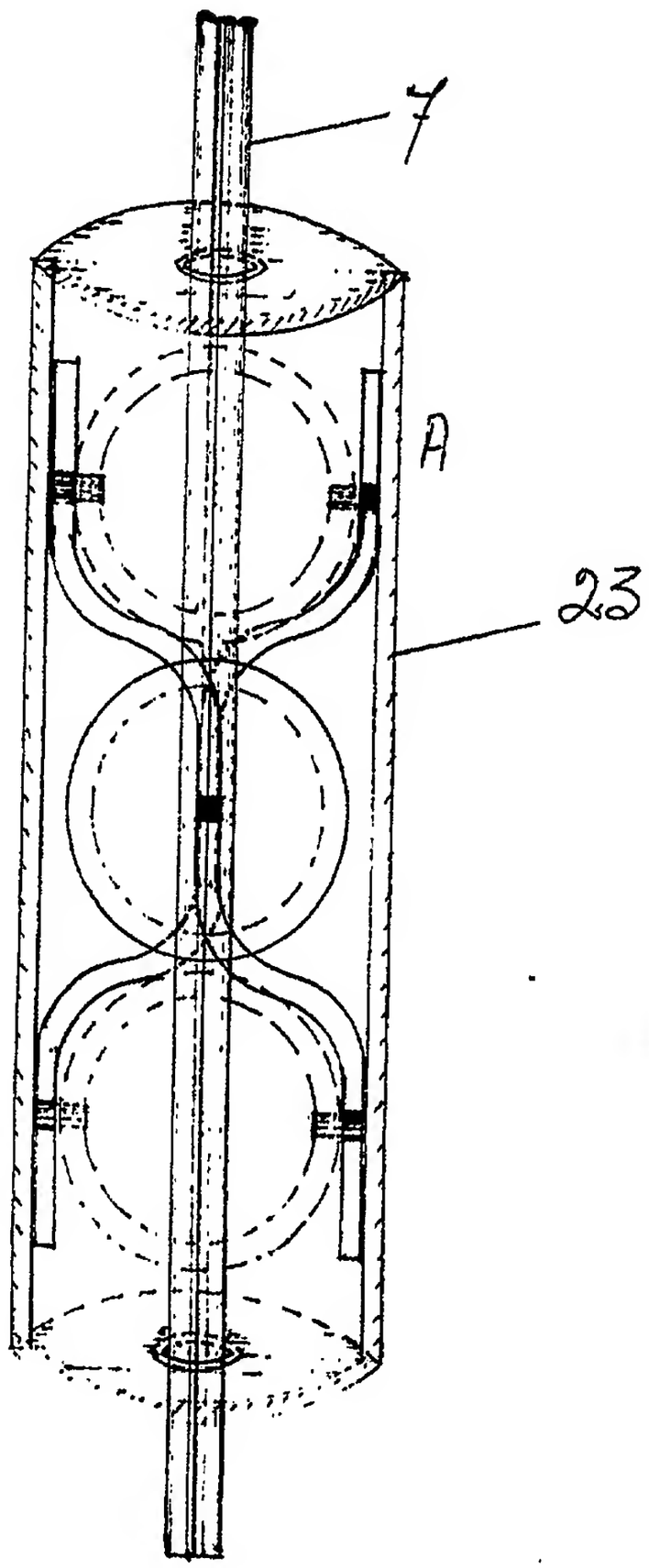
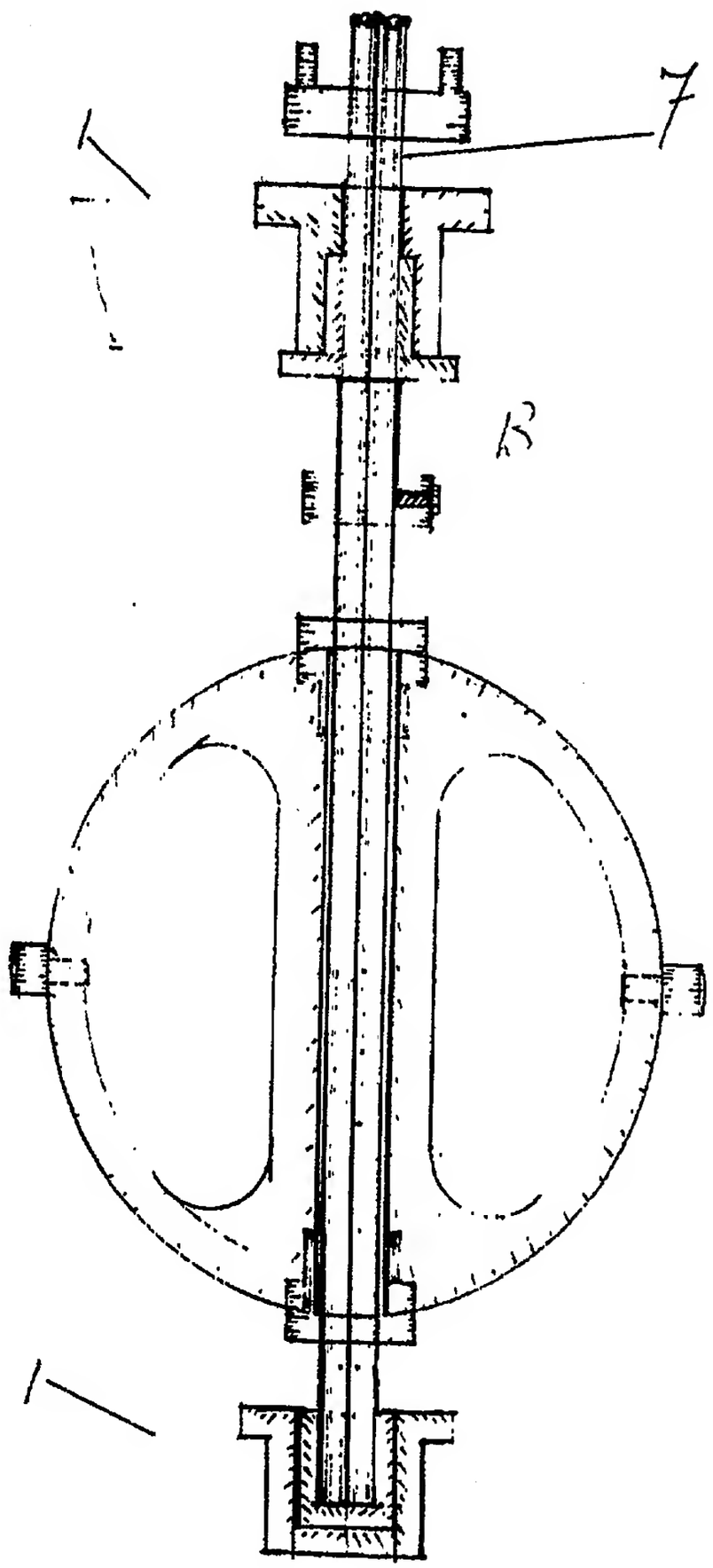


Fig 5





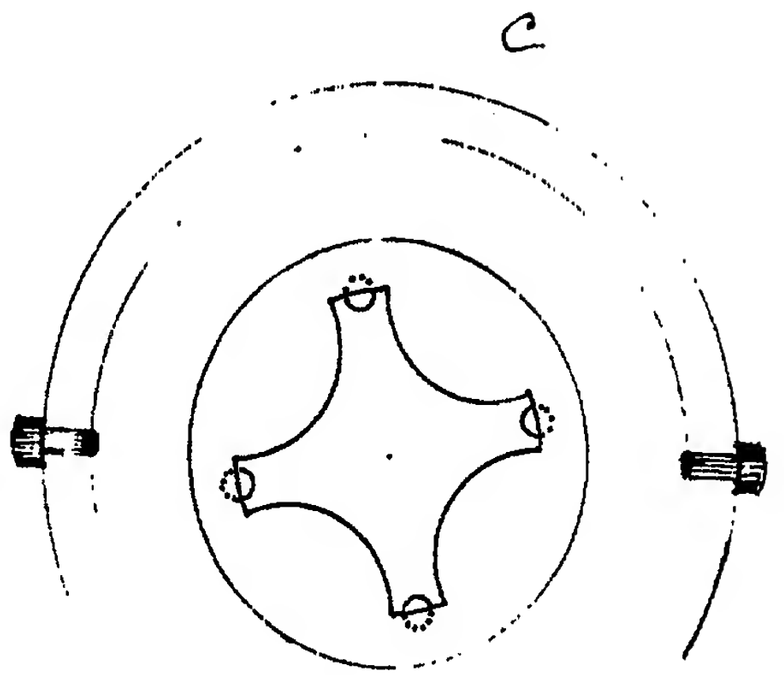


Fig: 6

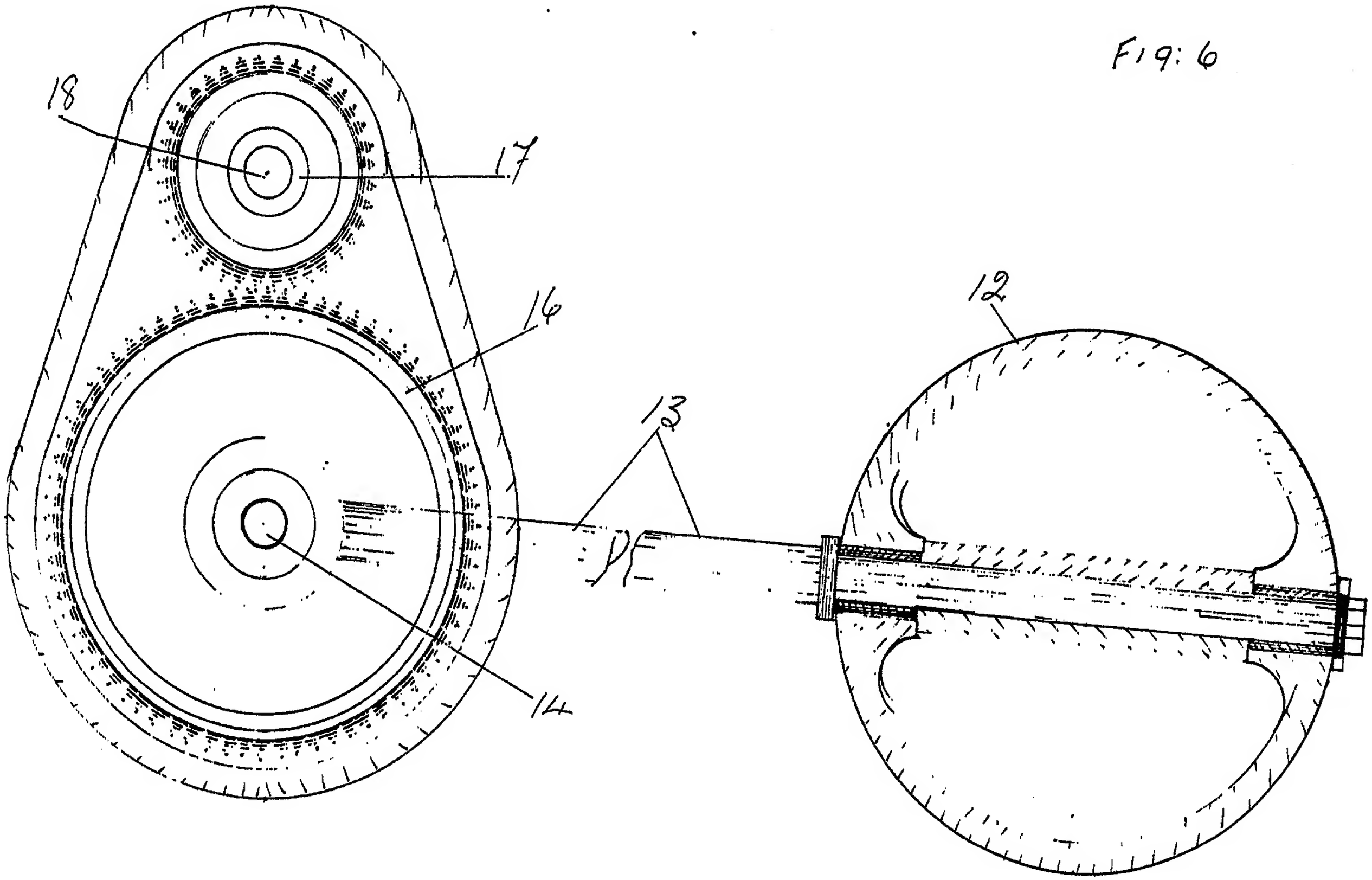
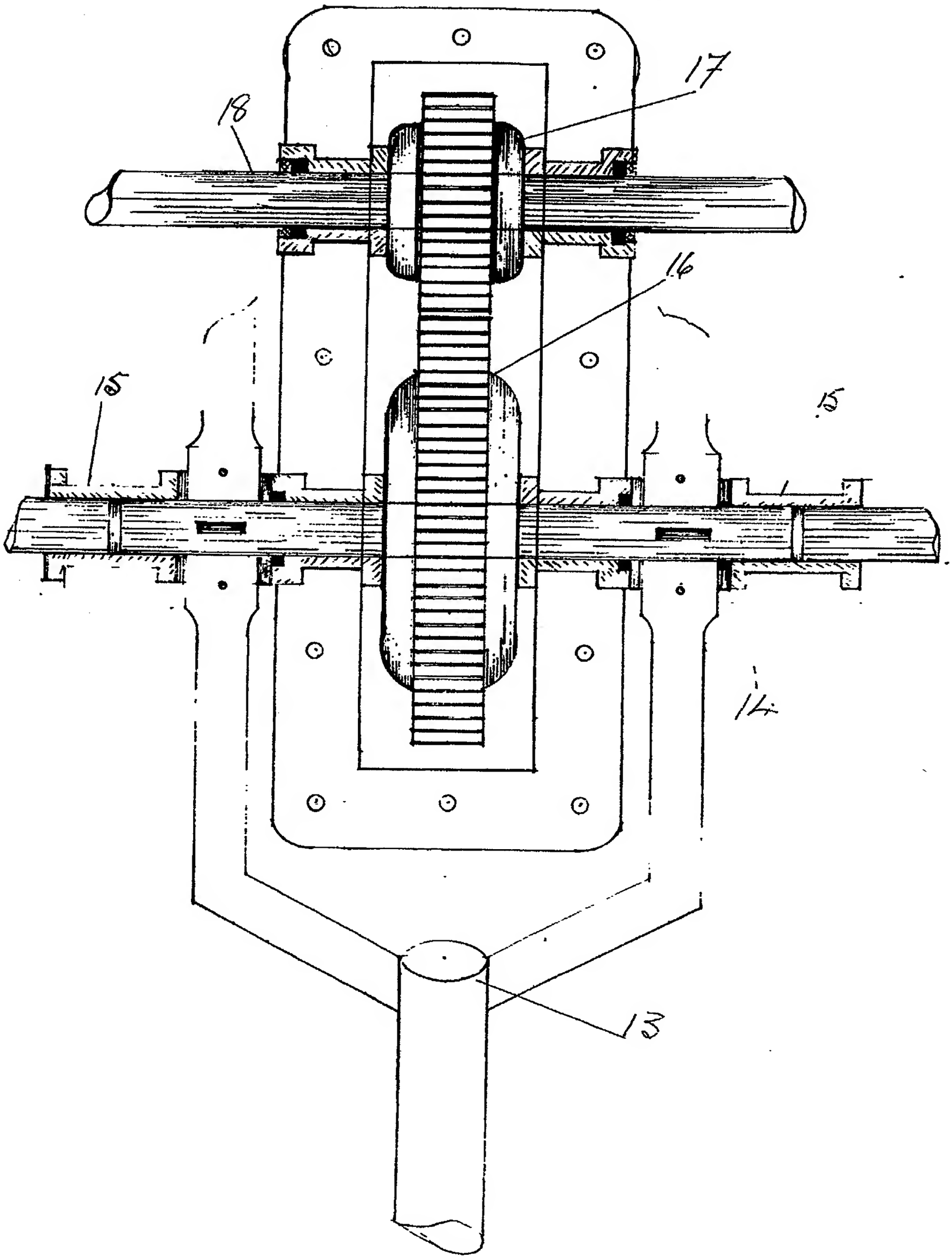


Fig 7



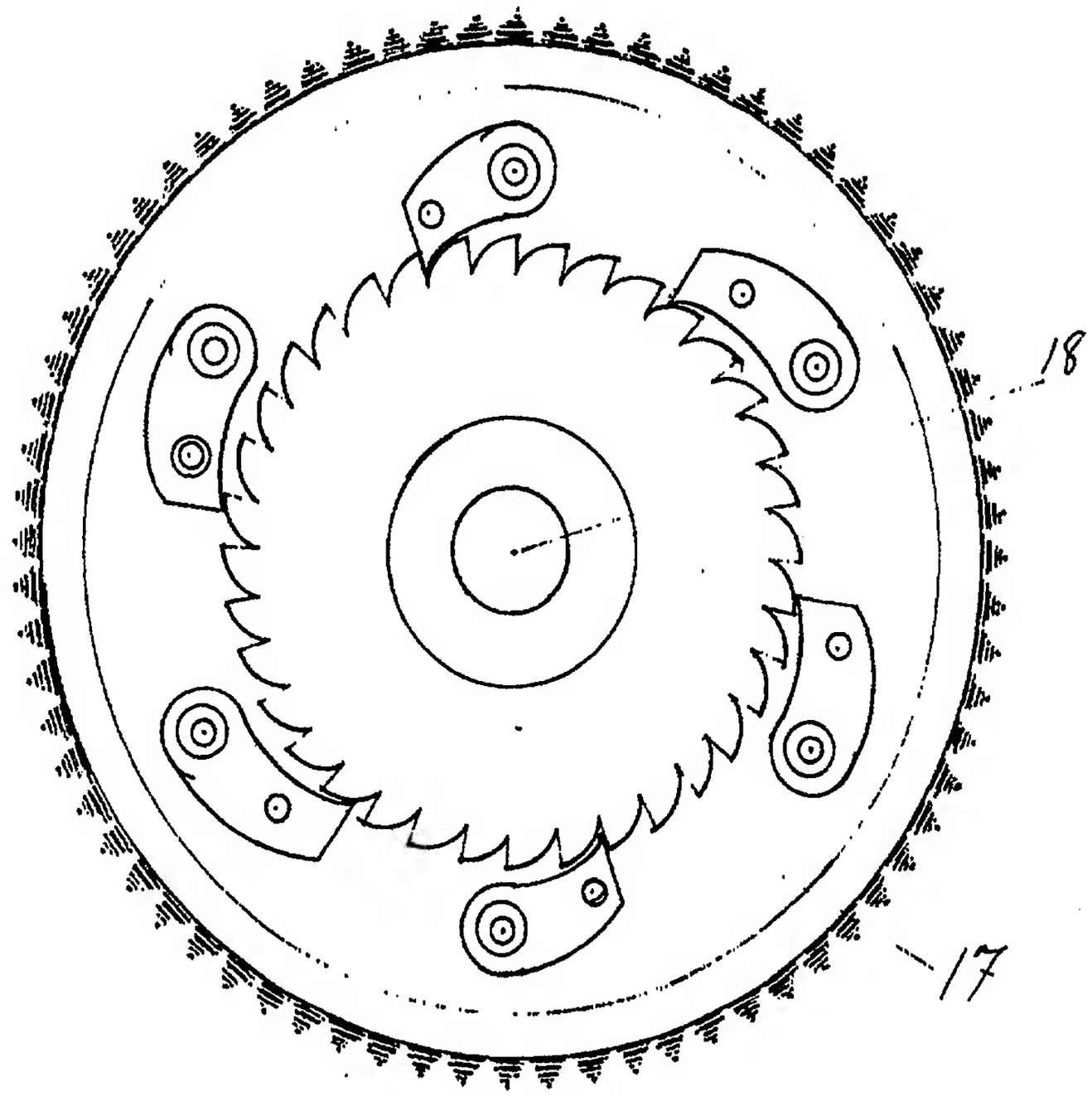
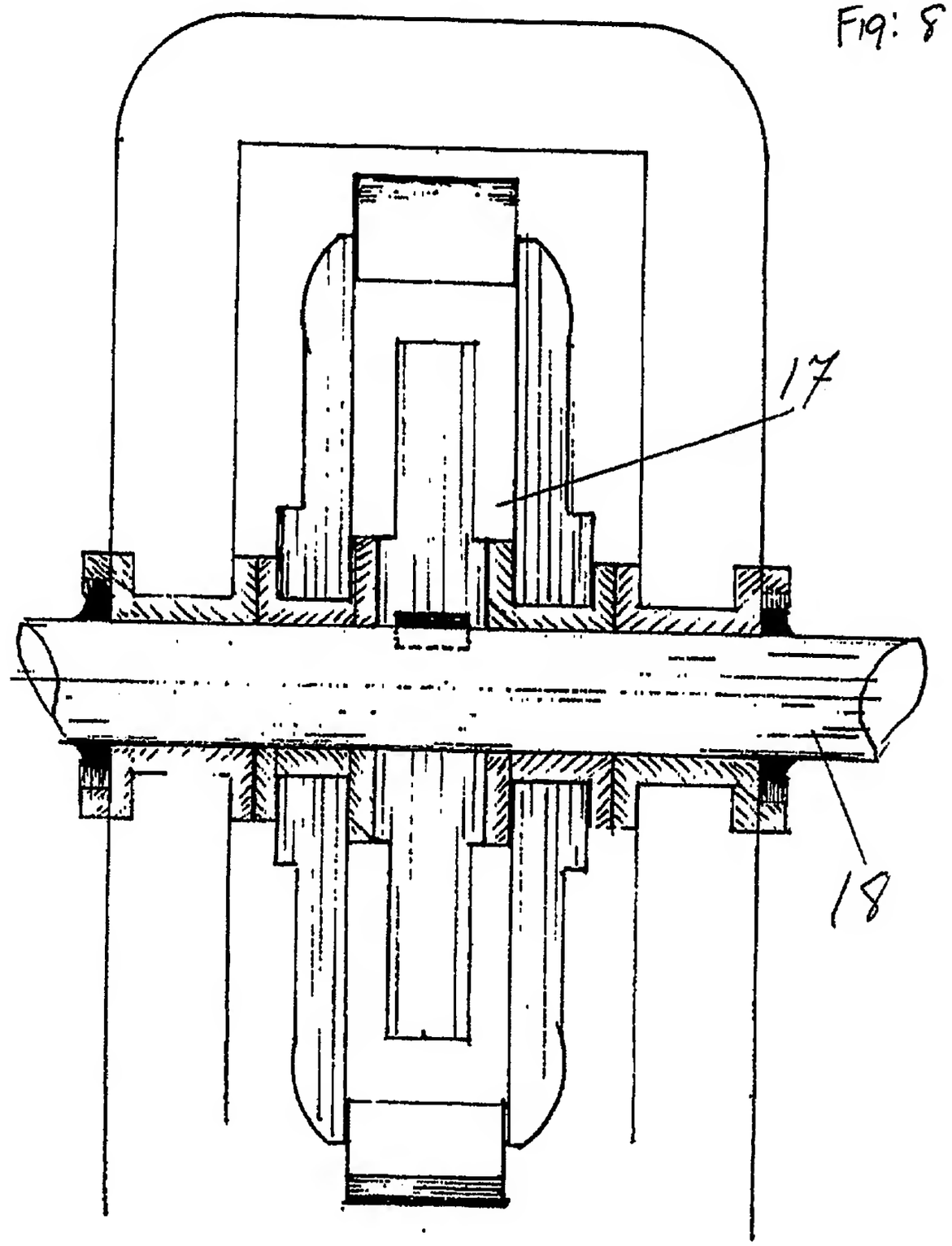


Fig: 8



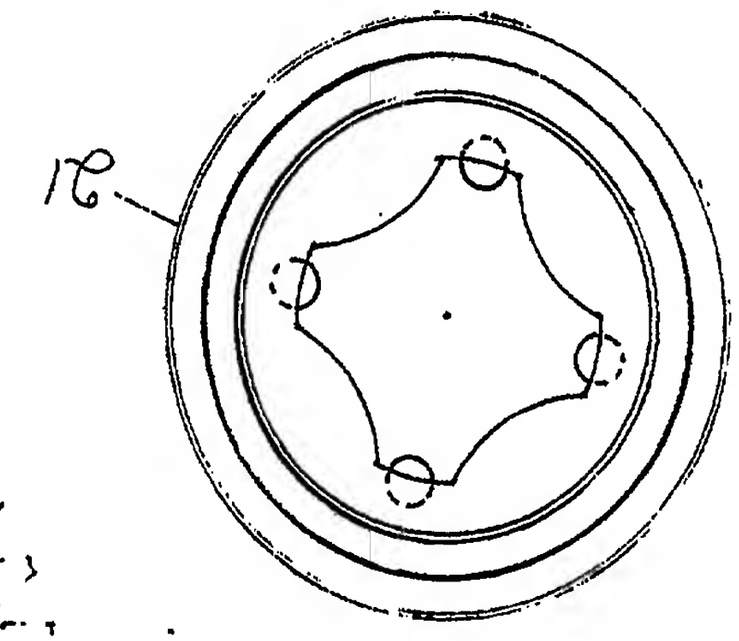


Fig: 11

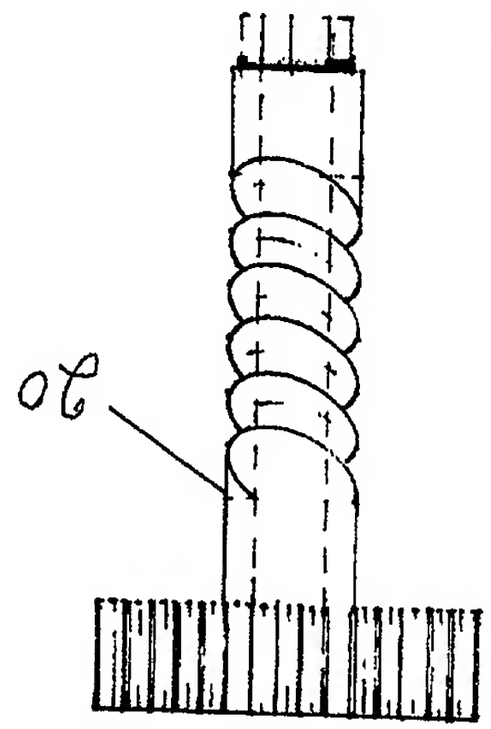


Fig: 10

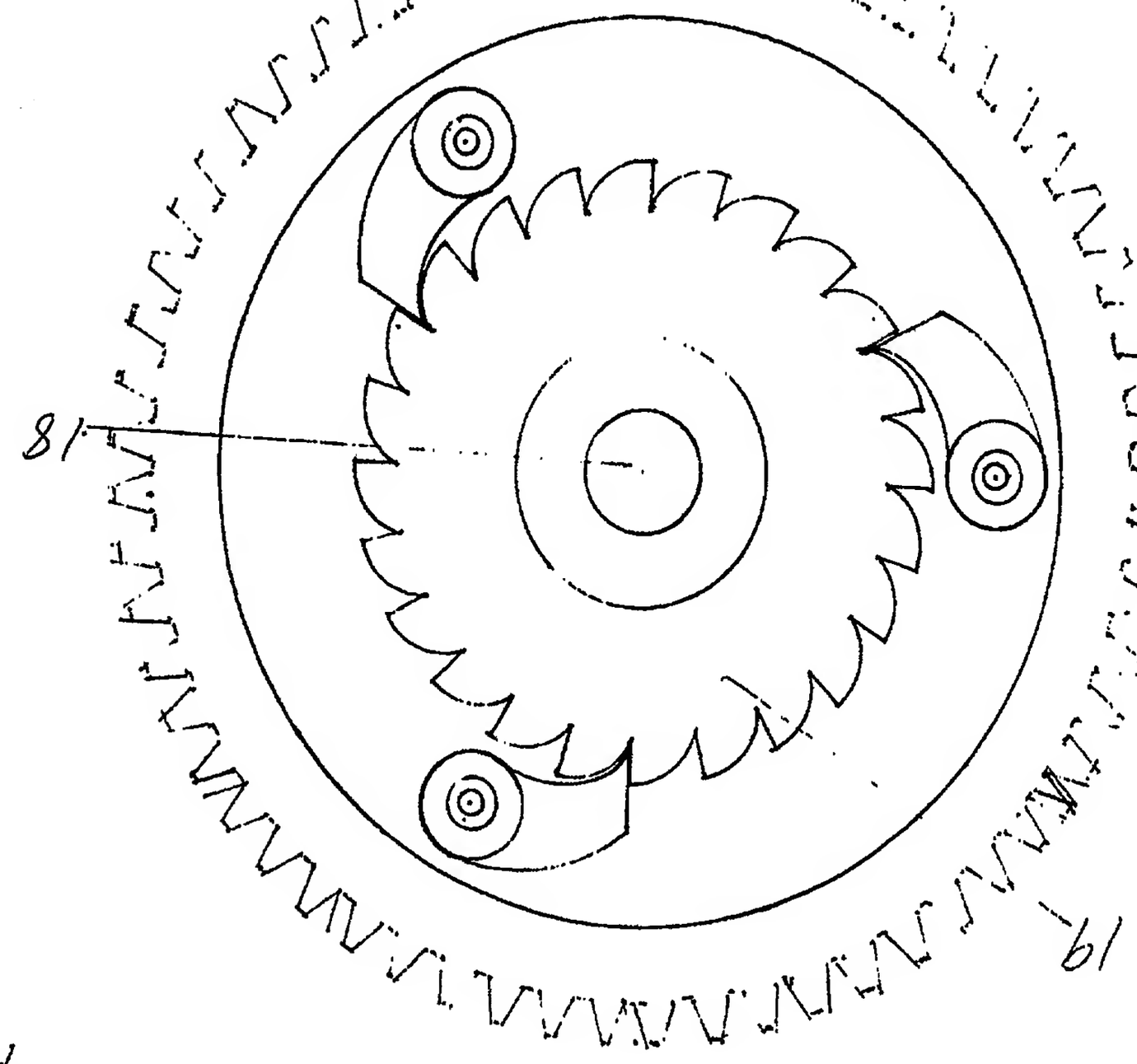
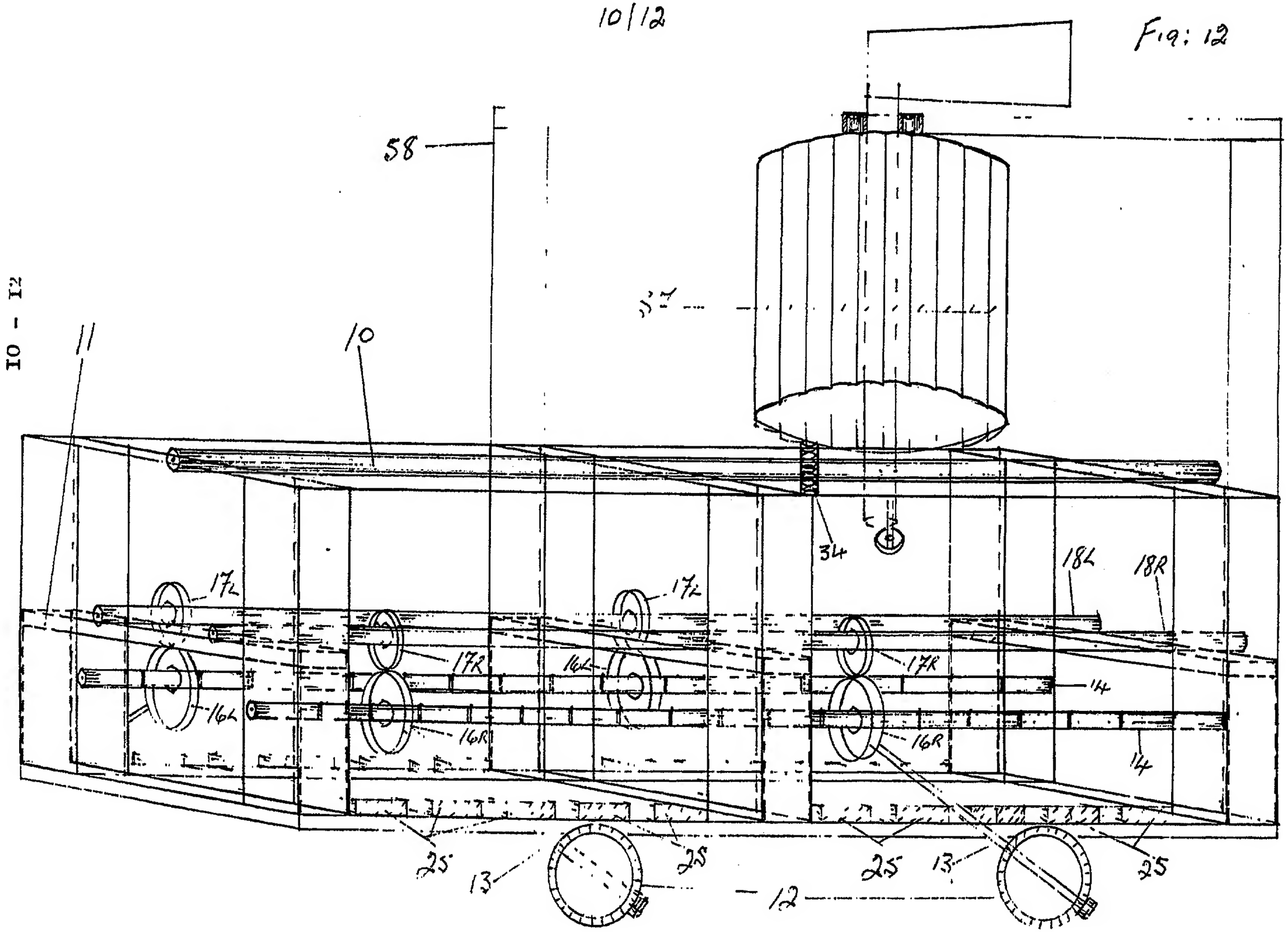


Fig: 9

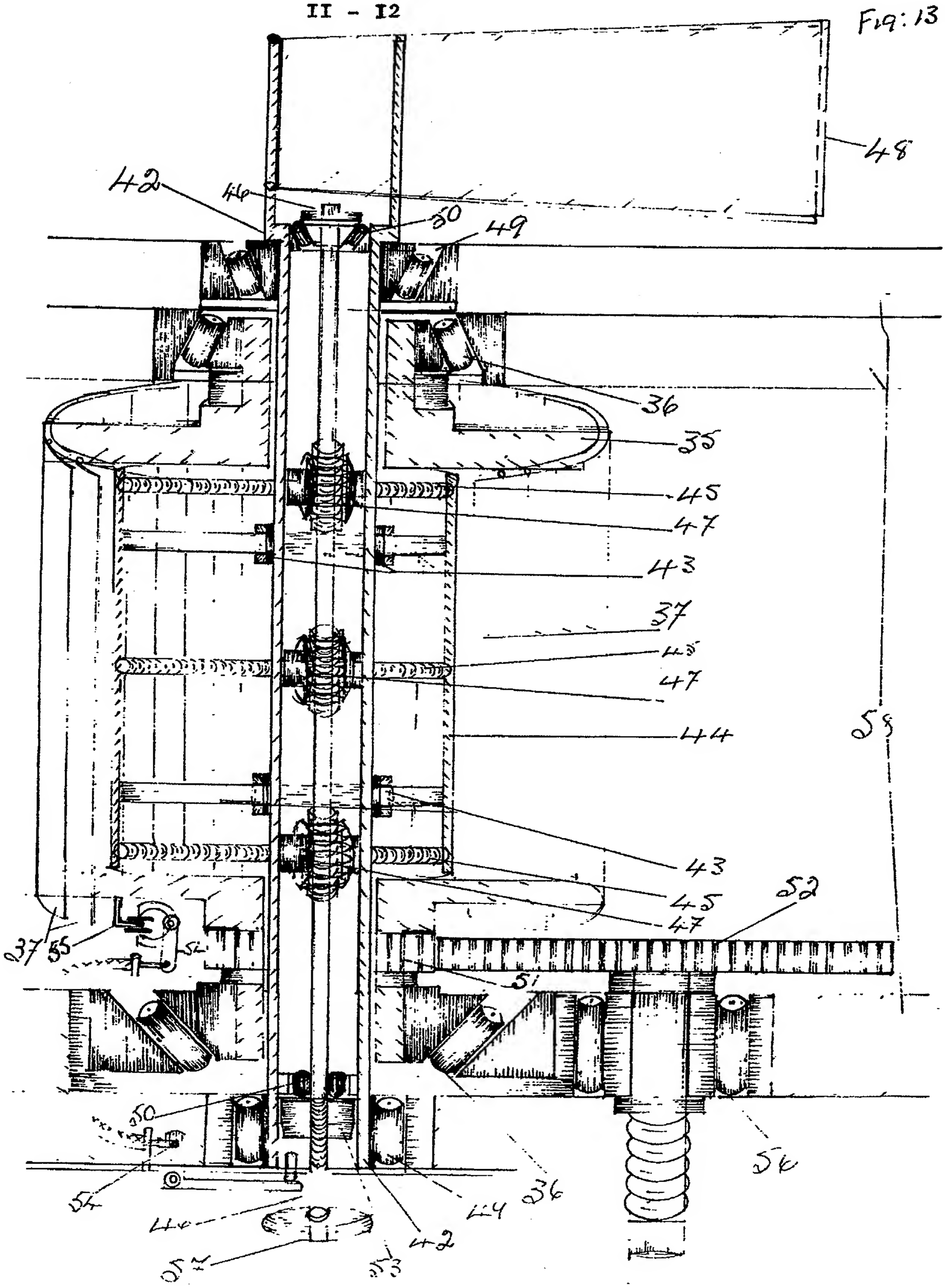
9/12

Fig: 12


58
57
10 - 12
11
10
34
18L
18R
17L
17L
17R
16L
17R
16L
14
16R
16R
14
25
13
25
25
13
25
12

II - I2

Fig: 13


48
42
46
50
49
36
35
45
47
43
37
45
47
44
43
45
47
52
37
55
51
50
54
54
46
42
36
57
53

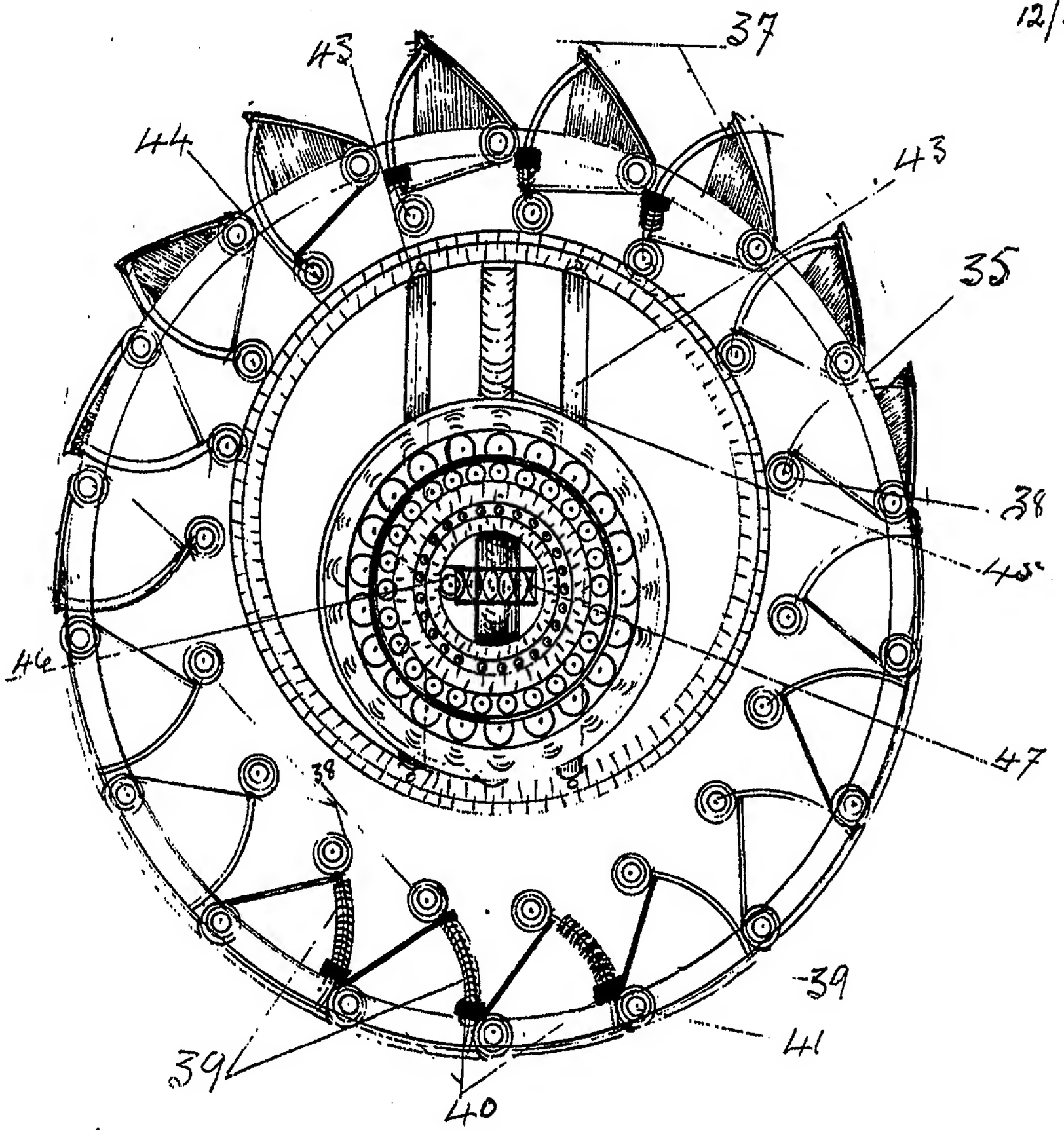


Fig: 14

A MECHANIZED CONSTRUCTION FOR HARNESSING NATURAL ENERGY OF THE SEA AND WIND AND CONVERT TO ROTARY POWER

The Invention relates to a Mechanized Construction for harnessing the Natural Energy of the Sea and Wind to convert same to Rotary Energy, for the purpose of Generating Electricity.

Necessity is the creator of this Invention. Never has it been so necessary as it is at the present time. It presents itself to us daily, obvious and glaring. The Air and Sea surrounding our Country is becoming dangerously contaminated and polluted by the current existing methods.

The question is why should it be so, when Nature has provided us with an abundance of resources of Free Natural Energy, which can be harnessed and converted to useful Pollution Free Power.

The present Invention is so designed to accomplish just that. Harnessing Natures free ceaseless energy, namely, the unfailing Sea Waves, Swells, Ripples, and also the Wind for its combined contribution and convert these mighty wasted energy to useful Rotary Power.

The present Invention is designed in the form of a series of Mechanized Structional "Sections". Each Section would consist and be functional by utilizing the rise and fall action of Ball Floats, in response to their floating upward thrust movement, on Swells, Waves, and any undulation of the Sea surface, and convey by their attached Arm Levers to the Multi Ratio Ratchet Units where it is converted to Rotary energy.

The Section Main Frame Structure, is mounted on Piles which are driven and secured in the Sea bed. The Main Frame Structure uprights, cradles and guides the uprights of a Platform Chassies. This Platform Chassies carries all of the mechanized components that is required to be raised and to be lowered in response to the Tidal water height variation.

These would most essentially be the Multi Ratio Ratchets and the Ball Floats. The Ball Floats are assembled swiveling, on the lower water end of the Arm Levers, whilst the upper ends are attached to the Stub Axles on which is mounted the primary drive Gear Wheel of the Multi Ratio Ratchet Units.

Maintaining the correct height of the Platform Chassies is most essential, to have the best suitable angle of the Arm Levers with the Ball Floats, in relations to the water level, and that of their upper ends with the Ratchet Units. The Ball Floats best functional angle would be as from zero bottom, their best radius of from 25 degrees through to 85 degrees. The upper end of the Arm Lever with the Stub Axle would be at 90 degrees. To achieve the correct height and to maintain that best angle for the Ball Floats upward thrust, there is in the Invention a designed Water Level Height Sensor, which is a lattice cylindrical cage, housing a Ball Float, and attached to the lower centre part of the Platform Chassies. When at the correct height, for the best results with the Arm Levers at the proper angle, holding the Ball Floats at their lowest point of their radius 25 degrees. The Water Height Sensor Ball Float will be floating on the water level at

mid centre position in the Sensor Cage, at this point it is in its neutral position.

A position that will always halt the Platform Chassies at the correct and best height for the functioning of the Ball Floats upward thrust, to influence the rotating effect on the Multi Ratio Ratchet.

When the incoming Tide rises, the Sensor Ball Float in its Cage and the Ball opposed protruding roller lugs will follow their guides in the Cage, and by doing so will force the Ball to semi rotate of up to 90 degrees. As the Sensor Ball Float centre through channel, is enveloping, and shaped mated with the Vertical Control Shaft, it will slide up or down, and also semi rotate the shaft. By doing so, the Vertical Control Shaft will engage one of the two Clutches, which will engage the lifting mechanism into motion, which will rise the Platform Chassies until the Sensor Ball Float finds its central neutral position once again in its Cage.

At ebbtide the water level lowers the Sensor Float in its Cage. The guides will semi rotate the Sensor Ball Float in the opposite direction, influencing the Vertical Control Shaft to do the same, and by doing so, will engage the alternate Clutch which will engage the lifting mechanism into a reverse rotation and lowering of the Platform Chassies, until the Sensor Ball Float and water level finds its centre neutral position in the Cage once again. Thus halting the Platform Chassies at its correct and best working height. It must be appreciated that the rate of elevating and of lowering of the Platform Chassies is done in gradual stages as the water level demands.

As previously mentioned the upward thrust of the Ball Floats are conveyed by the Arm Levers, to semi rotate the Stub Axles on which is mounted the Primary Drive Gear Wheel of the Multi Ratio Rachet Units. As this Primary Gear Wheel is two or three times, or to the ratio required larger in circumference than its mated meshed driven Gear Wheel which houses a Multi Pawl Lever Ratchet. This is mounted on the Secondary Drive Shafts. The Multi Pawl Lever Ratchet is designed to eliminate any wastage of travers, so that the least upward thrust of the Ball Floats is positively conveyed to influence the rotation of the Secondary Drive Shaft.

The Secondary Drive Shafts one on each side of the Platform Chassies carries all of the Secondary Gear Wheels with their internal Multi Pawl Lever Ratchets of the Multi Ratio Ratchet Units.

Between them they respond to and convert the upward thrust of possibly about four hundred or so Ball Floats of approximately two metres in diameter per SECTION into a rotary power.

The rotary energy is transmitted off these Shafts by their end mounted Gear Wheels, which houses a Standard Ratchet each and are meshed to and drives a pair of intermediate Gear Wheels, which are meshed to each other. As their Worm Screw Hub Shafts are meshed to and drive the same one Crown Wheel Sleeve. Therefore their synchronization is important. Should the Rev: speed of the one side of the Secondary Drive Shafts vary from the other, their mounted Gear Wheel Ratchets will operate and equalize.

The Crown Wheel Sleeve is the first point of the united Impeled Energy, of the Right, and of the Left side of the Platform Chassies. It also

transfers from the Horizontal Drive Shafts to the Vertical Drive Shaft for transfering of the SECTIONS Rotary Energy to the over head horizontal Main Drive Shaft. The Crown Wheel Sleeve envelopes and is designed in shape so as to travel up or down with the rising or lowering of the Platform Chassies, whilst continuing to rotate the Vertical Drive Shaft.
The Vertical Drive Shaft transfers its drive by means of its Worm Screw Head, meshing to and driving a Crown Wheel Ratchet attached to the SECTIONS overhead Main Drive Shaft.

As previously mentioned a SECTION is one of a series of SECTIONS in the Invention intended Constructed Site. The only mechanical rotary connection between each SECTION would be the linkage of the overhead Main Drive Shafts by means of Telescopic Shaft linked through a Universal Coupling to a Standard Ratchet. Therefore should any one SECTION fail to deliver its rotary energy, or be retarded to synchronize with the speed of the Main Drive Shaft, the Crown Wheel Ratchet will operate and equalize. The Standard Ratchet in the linkage between the SECTIONS Main Drive Shafts will tolerate and equalize any miss synchronization in the revolving speed between any of the series connected SECTIONS.

The only power taken off the Section overhead Main Drive Shaft is by the Gear Wheel, which drives the two Clutch Units for engaging the lifting and lowering mechanism.

Whichever of the two Clutches is engaged it will rotate the lifting mechanism in reverse rotation to the other. Which ever is engaged it will transfer its drive to the chain Sprocket, which drives the one only Chain that activates and rotates instantaneous and sychronously all of the Shafts with their worm screw ends, that are meshed to and drives the Crown Wheel Heads of the Vertical Worm Screw Shafts. These Vertical Worm Screw Shafts are assembled in their stop end float bearings in each of the Sections, Main Frame Structures uprights. They are threaded through the female Worm Screw Boxes which are self centralizing in the uprights of the frame work of the Platform Chassies. So when the Vertical Worm Screw Shafts are engaged in a revolving motion, they will wind up or down their mated worm screw Boxes, which will lift or lower the Platform Chassies.

The uprights of the Platform Chassies are guided by Rollers or Tyred Wheels in the channeld uprights of the SECTIONS Main Frame Structure. As these uprights are arranged in opposed pairs at equal intervals, the design has made it possible by its synchronous rotary action of the Vertical Worm Screw Shafts to have extensive long Sections of possible, four hundred or so Ball Floats with their M.R. Ratchets on each Section, that is two hundred, or so each side. To assist with the weight, the Platform Chassies is fitted with weight assisting under Floats.

The Wind rotor is in its own Frame Work and mounted on an upper Deck of the Section Main Frame Structure. It makes its contribution of its rotary Energy by means of its reduction Gear Wheel worm screw hub Shaft meshing to and driving a Crown Wheel Ratchet on the Section Main Drive Shaft. It's rotary drive is introduced to the Main Drive Shaft by means of a Crown Wheel Ratchet. For should there be a failure or retardation in its speed to coincide with that of the Main Drive Shaft, the Ratchet will free wheel and will not impeed the out put of the Section.

The Rotor consists of a vertical Cylinder Body, dimensionally appropriate to the width of the Section Main Frame Structure of approximate Diam: of I2 metre wide and 6 metres high. It carries approximately 36 wind interupting Vanes attached vertically by spindles at the one vertical end, which enables the Vanes to swivel and semi rotate to a 45 degree of opening, to interupt the main force of the wind when timed and influenced to do so by the adjustable Setting of the Cylinder Cam. The Rotor Cylinder Body is mounted and rotates on its own Top and Bottom Bearings which are mounted in its Main Frame. The Cylinder Cam is adjustably, mounted and carried on a Centre Tubelar Post by means of telescopic shafts through sleeves. The sleeves, paired, attached horizontally, straddling, the Centre Tubelar Post. The shafts through the sleeves are attached to the inner wall of the Cylinder Cam, at both ends. It is adjusted by means of worm screw shafts threaded through the female worm screw hubs of Crown Wheels assembled internally in the Centre Tubelar Post. The Crown Wheels are meshed to Worm Screw Sleeves attached to a Vertical Control Staff which extends through the centre of the vertical Centre Tubelar Post. This shaft revolves on its own bearings which are housed in the Centre Tubelar Post. When rotated by the manual control wheel its attached worm screw sleeves will influence their mated Crown Wheels also to rotate, by doing so will winde through the worm screw shafts, as these shafts are at both ends swivelling in their Bearings which are attached to the Cylinder Cam inner walls. The Cylinder Cam will move and be adjusted from centre to off centric position to the degree of opening required of the wind Vanes. The Cylinder Cam will influence the opening of the Vanes as the Jockey Wheels which are mounted on the Vanes curved angled elbows are also riding the outer wall of the Cylinder Cam. Therefore the adjustable setting of the Cylinder Cam determines the opening angle of the Wind Vanes.

As the Cylinder Cam is mounted and carried entirely on the Centre Tubelar Post, its adjustment to off centre position will also be in relation to the Centre Post.

Towering above the Rotor and attached to the upper end of the Centre Post it carries the wind directional Vee Vane. As the Vane will always direct itself into the main force of the Wind, and that its attached to the Centre Post on which is mounted the Cylinder Cam. So when the Cylinder Cam is adjusted to off centre position its riding Jockey Wheels will open the wind interrupting Vanes at the precise position, to interrupt the main force of the wind. As they rotate past the wind obstructing position the Cylinder Cam allows the Vanes to be closed by their returning springs. On their return cycle towards the wind flow and their reopening position, the Vanes are closed in their respective recesses on their insulated seatings showing only smooth frictionless, resistance free surface. Therefore the Rotor developing its full power from the wind force. As the wind directional Vee Vane directs the position of the Centre Post with its mounted Cylinder Cam, the slight torque effect caused by the riding Jockey Wheels on the Cylinder Cam is compensated by having the one wing of the Vee Vane, the wing opposite the rotation, adjustable to the extent that the wind flow bearing on that wing will counter balance the torque effect.

The Vertical Control Shaft as previously mentioned extends through the Centre Tubelar Post and when manually rotated will adjustably move the Cylinder Cam to off centric position for Vane opening and set the Rotor into working motion. When rotated in the reverse direction it will wind the Cylinder Cam back to its centre position which will allow the returning

Springs to keep all Vanes in the closed position. At this point the Brake Plunger would have wound itself down the rotated Control Shaft and engage the Brake mechanism and bring the Rotor to a halt.

The power take off point of the Wind Rotor is by means of a Gear Wheel attached to the base of the Rotor Body, meshing to and driving a reduction Gear which as previously mentioned its worm screw hub shaft is engaged to and drives the Ratchet Crown Wheel on the Section's over head Main Drive Shaft.

In the wider aspect of the Invention, a Constructed Site Installation would consist of numerous SECTIONS which would be arranged in Tandem Formation, or Multi Parallel Tandem Formation.

Each SECTION in the Tandem Formation have their Main Drive Shafts connected in series by means of Telescopic Shafts connected via Universal Coupling to a Standard Ratchet.

The Universal Coupling and the Telescopic Shafts would tolerate any misalignment that could develop between the SECTIONS Main Frame Structures. The Standard Ratchet will tolerate any variation of rotating speed between the Main Drive Shafts of one SECTION and another. These Ratchets would be equipped with a disengaging mechanism.

The Tandem Formation Parallels will also be connected by means of Telescopic Shafts, Universal Couplings and Ratchet Gear Wheels. Their Drive Shafts would unite at a central point and coupled to and drive the one Main Shaft which will extend to a Power House which could be inshore or offshore.

Each incoming Swell and Wave will effect the upsurge of each Ball Float in the Tandem Formation individually as it travels in shore. Hence the benefit of a Multi Parallel Tandem Formation, where as several Ball Floats will benefit on the wider area from the same Swell or Wave.

One of the advantages of the Invention is that it is designed that additional SECTIONS can be added on and connected at any future time without interrupting the normal working of the Installation. This is due to the inclusion of the mechanism Ratchet in the main shaft series to operate and disengage its drive and immobilize a SECTION.

The Invention is designed with a view of having numeral Constructed Site Installations staggered around the Country with emphasis on the most significant areas that we do have around our Coast Line. This will be beneficial as the Elements we are dealing with can be very variable as we have experienced the variation in the daily weather conditions we receive in different Coastal areas of the Country.

The ideal sites for these Installations would be obscured positions behind steep cliffs where there is always a substantial depth of water at ebbtide and free of any environmental consequences.

The advantages of this Invention is:-

A Source of Energy. Ever lasting.

B Unlimited supply of Energy.

C Absolute Pollution Free.

D No Environmental Consequences.

E Running Costs NIl.

F Maintenance Costs. With the Modern Technology and experiences of today in the Sea Water Construction, the maintenance costs would be very low, especially as all rotating mechanism of the Construction with exception of the Wind Rotor is of low revolving speed.

G Cost of Developing. Minimal in comparison with other types of fuel Power Stations or of the Tidal Barrage Schemes.

H An Installation could be working and producing in matter of months not years.

I No Barraging. Just the SECTIONS Structures secured to Pile's anchored in the Sea Bed.

J Fully Automatic Tidal Water Level Height Controlled which will elevate or lower the necessary mechanism in gradual stages to maintain the best working positions in response to the Tidal water level height variations.

K No limits to the number of SECTIONS that can be used on a Site Installation, and additional SECTIONS can be installed and connected at any future date without interruptions to the normal functioning of the Installation.

L The Sea Power section and the Wind Rotor section, although described as a combined unit can be used separately if need be. The Wind Rotor Section can be mounted on a structional Tower and used on Land.

MECHANIZED DESCRIPTION OF A SECTION WITH REF: TO DRAWINGS

1. MAIN FRAME STRUCTURE. The Main Frame is rigidly mounted on Pile's, 2. Fig: 1.3. The Structure uprights will be of the channel type which will act as a guides to the up and down movement of the uprights of the Platform Chassies, II. Fig: 1.3.

   It will also carry the three Vertical Shafts with their stop end float bearings, worm screw heads, and Crown Wheels, 3. and 5. Fig: 2.3 and 7. Fig: 3.

2. PILE'S. The Pile's are driven into and secured to the Sea Bed for securing rigidly the Main Frame Structure, I Fig: 1.

3. VERTICAL WORM SCREW SHAFTS. The Worm Screw Shafts are engaged through the female worm screw Boxes, 8. Fig: 3 and their overhead Crown Wheels meshed to and rotated by the drive off the Worm Screw Sleeves on Shafts, 31 Fig: 4 for the purpose of rising and lowering of the Platform Chassies, II. Fig: 1.3.

4. FLEXABLE BELLOWSING CONDUIT. The Conduit as protection for the lubrication of the Worm Screw Shafts, 3. Fig: 2.3. The bellowsing of the Conduit will respond to the up and down movement of the female Boxes, 8 Fig: 3 winding up and and down on the Worm Screw Shafts, 3. Fig: 2.3 when rising and lowering of the Platform Chassies, II Fig: 1.3.

5. VERTICAL DRIVE SHAFT. The Vertical Drive Shaft is rotated by the enveloped shapemated Crown Wheel Sleeve, 21, Fig: 2. The Shafts Worm Screw Head is meshed to and drives the Crown Wheel Ratchet, 26. Fig: 4 on the Section Main Drive Shaft, 10. Fig 1.4.

6. FLEXABLE BELLOWSING CONDUIT. The Conduit is protection for the lubrication of the Vertical Drive Shaft, 5. Fig: 2 for the ease of the up and down movement of the Crown Wheel Sleeve, 21. Fig: 2. Whilst still rotating and driving the Shaft, 5. Fig: 2.

7. HEIGHT CONTROL VERTICAL SHAFT. The Height Control Shaft, will react and semi rotate as influenced by the Height Sensor Float mechanism 23. Fig: 3.5. The Shaft in turn will engage either of the two Clutches 28, Fig: 4 which will engage the lifting and lowering mechanism into motion.

8. WORM SCREW THREADED BOXES. The Boxes are centrally worm screw threaded, to mate with the Vertical Worm Screw Shafts 3. Fig: 2.3 and are self centralizing in the uprights of the frame work of the Platform Chassies, II. Fig: 1.3 this will rise and or lower the Platform Chassies in response to the rotary action of the Shafts 3 when the lifting and lowering mechanism are engaged into motion.

9. FLEXABLE BELLOWSING CONDUIT. The Conduit is for the protection of the lubrication of the Height Control Shaft, 7. Fig: 3.5 for the ease of the up and down movement of the Sensor Ball Float of the Tidal Height Sensor, 23. Fig: 3.5.

10. THE SECTION MAIN DRIVE SHAFT. The Section Rotary Energy is Transfered through the Vertical Drive Shaft 5. Fig: 2 to rotate and drive this Main Shaft by way of the Vertical Drive Shaft 5, Fig: 2.3 Worm Screw Head, meshing to, and driving the Standard Ratchet Crown Wheel 26. Fig: 4 which is attached to the Main Shaft. Also the Wind Rotor contributes its rotary power to drive this Shaft by mean's of the Worm Screw Hub Shaft of Gear Wheel, 52. Fig: 11 meshing and driving the Crown Wheel Ratchet, 34. Fig: 4.

11. PLATFORM CHASSIES. The Platform Chassies carried all mechanism that requires to be Rising and or Lowering in response to the Tidal Water Height variation, items:- 12 to 25. Fig: 1.2.3. The Platform Chassies is supported and assisted for ease of lifting by the Under Floats, 25. Fig: 1.3.

12. BALL FLOATS. The Ball Floats are assembled on Arm Levers, 13 Fig: 1-2 by means of non metalic bearings that can be water lubricated. The bearings will allow the Ball Float to swivel and or rotate on the Arm Lever 13 so as to minimise any flotal side thrust, and will regularly vary the Ball Float surface exposed to air and that of immersed under water.

13. ARM LEVERS. The Arm Levers are attached to the Ball Floats, 12. fig: 1 - 2 on the lower water ends and secured to Stub Axles 14. Fig: 1 on the opposite upper end. This will semi rotate the Stub Axle, 14 as influenced by the rise and fall of the floating action of the Ball Floats, 12. Fig: 1.2.6. (Their upper ends extends, beyond the Stub Axles for counter weight, or spring tension to counterbalance forward weight.) Not shown on drawing.

14. STUB AXLES. The Stub Axles are secured to the Arm Levers 13. Fig: 1 Centrally assembled on the Axles, is the Primary Drive Gear Wheel of the Multi Ratio Ratchet Unit, 16. Fig: 1.6.7. The Axle will semi rotate on their carrier bearings which are mounted on the "A" Frames, 15. Fig: 1.

15. "A" FRAMES. The Frames are secured to the base platform of the Platform Chassies, II Fig: 1.3 they will support and housed the carrier bearings for the Stub Axles, 14. Fig: 1 and the secondary drive Shafts 18R - 18L Fig: 1.3. The bearing housings will carry their own seals for retaining in lubricant, and expel water.

16. PRIMARY DRIVE GEAR WHEEL. The Primary Drive Gear Wheel is part of the Multi Ratio Ratchet Unit Fig: 7. It is centrally assembled on the Stub Axle 14. Fig: 1.7 and meshed to drive its twin housed Gear - Wheel, 17. Fig: 1.7 which is the Multi Pawl Lever Ratchet. The Primary Gear Wheel being two or three or to the Ratio required larger in circumference than the secondary Ratchet Gear Wheel, 17, Fig: 1.7 Hence the Multi Ratio Ratchet.

17. MULTI RATIO RATCHET SECONDARY GEAR WHEEL. This Gear Wheel houses the Multi Pawl Lever Ratchet. The Ratchet mechanism consists of three pairs of Pawl Levers but only allowing one pair which are directly opposite to each other to fully engage simultaneaously. The other opposed pairs are staggered, so at any position there is one pair of pawl levers always engagable. This is designed to eliminate wastage

of traverse of the Pawl Levers before meshing. It also enables a sturdy toothed Pawl Lever Ratchet to respond and perform like a fine toothed Ratchet. As this secondary Ratchet Gear Wheel is mounted on the Secondary Drive Shaft, I8R and I8L, hence the least upward thrust of the Ball Floats 12. Fig: 1.2.6 will positively influence the rotation of the secondary Drive Shafts, 18R and 18L: Fig:. 7 shows the Primary Gear 16 and secondary Gear housing Ratchet 17, as a complete Multi Ratio Ratchet Unit in their Housing and in their respective positions on Shaft 18, and on Stub Axle 14, on their bearings and protective Seals.

18. HORIZONTAL SECONDARY DRIVE SHAFTS. These Shafts are refered to as the 18R and 18L, being the right hand side and the left hand side of the Platform Chassies II Fig: 1.3 as situated in the Main Frame Structure 1. Fig: 1.3. As the Ball Floats 12 and the Ratchet Units are mounted on dual sides of the Platform Chassies II these Shafts carry all of the M/R Ratchets secondary Gear Wheels mechanism 17. Fig: 1.8 and the Ratchet Units Housings. They also carry their own driving Gear Wheels which Houses a Standard Ratchet 19R and 19L, Fig: 2.9 and are meshed to and drive the Intermediate Gear Wheels, 20 Fig: 10.

19. STANDARD RATCHET GEAR WHEELS. These Ratchet Gear Wheels are refered to as 19R and 19L. They are assembled on the Shafts 18R and 18L Fig: 1.2.3 for the purpose of the dual side functioning of the SECTION. The Gear Wheels are meshed to and drive the Intermediate Gear Wheels, 20, Fig: 2.10. The Ratchets will operate should the need arise to disengage the drive from either of the sides whilst the other side can operate unhindered.

20. INTERMEDIATE GEAR WHEELS. These are refered to as 20R and 20L. They are driven by the Ratchet Gear Wheels 19R and 19L and have their toothed Gear Wheels meshed to each other so that they are synchronous at all times. As their worm screw hubs shafts are meshed to and drives the same one Crown Wheel Sleeve 21. Fig: 2.10. As this is where the contribution of the rotary energy of the dual sides of the SECTION is amalgamate and transfered to the Crown Wheel Sleeve, 21 Fig: 2 and on to the rotary drive of the Vertical Drive Shaft, 5. Fig: 2. Should there be any variation in the rotary speed between the two Drive Shafts 18 in relation to each other at point of amalgamation, i.e. drive to the Crown Wheel Sleeve, 21 the Ratchet Gear Wheels 19R and 19L will act and equalize.

21. CROWN WHEEL SLEEVE. The Crown Wheel Sleeve is meshed to and rotated by the Worm Screw Hub Shafts of Gear Wheels 20R and 20L, Fig: 2.10. The Crown Wheel Sleeve envelopes and is shape mated with the Vertical Drive Shaft 5. Fig: 2 so as to move up and down with the Platform Chassies, whilst continue to rotate and drive the Shaft.

22. CROWN WHEEL SLEEVE BEARING. This bearing is housed in the cross member of the Platform Chassies, II. Fig: 1.3 the Sleeve will revolve internal of the Bearing and the Bearing flanges will tolerate the lifting and lowering of the Crown Wheel Sleeve 21. Fig: 2 on the Vertical Drive Shaft 5. Fig: 2 as the Platform Chassies II rises and lowers itself in response to the Tidal Water Height Sensor, 23, Fig: 3.5.

23. TIDAL WATER HEIGHT SENSOR. The water height Sensor consists of a Caged Ball Float. The Cage is attached to the centre lower part of the Platform Chassies II. Fig: 1.3. When the Ball Float rises with the incoming tide, the Ball opposed protruding Roller Lugs will follow their guides in the Floats cage and will force the Ball Float into a semi rotation of up to 90 degrees. As the Ball Float centre through channel is enveloping and shape mated with the Height Control Vertical Shaft, 7. Fig: 3.5 this will also semi rotate the Shaft, by doing so the Shaft will engage one of the two Clutches 28. Fig. 4 which will engage the lifting mechanism into motion and The Platform Chassies will rise until the Ball Float finds its mid: neutral position in its cage and disengages the Clutch. This mid: neutral position of the Ball Float will always maintain the Platform Chassies II at its correct and best height position for the best angle for the Arm Levers, I3. and Ball Floats I2 to function at their maximum upward thrust.

At ebbtide the Ball Float will lower itself in the cage and by doing so will follow it's guides and semi rotate in the opposite direction forcing the Vertical Height Control Shaft, 7 Fig: 3.5 to do the same, by doing so will engage the alternate Clutch 28 Fig: 4 which will engage the lifting mechanism in to reverse rotation and lowering of the Platform Chassies II until the Ball Float arrives at its mid: neutral position, and disengaging the height control mechanism again at the correct height. Naturally to cope with the tidal varing height from one extreme to the other will be done in several gradual stages as the mechanism will react as the Sensor Float and water Level moves from its mid; neutral position in the Cage.

24. GUIDE ROLLERS OR WHEELS. The side and end Rollers or Wheels, are for guide and easement of the up and down travers of the Platform Chassies, II in the channeld uprights of the Main Frame Structure, I. Fig: 1. Rollers only shown in drawings.

25. UNDER FLOATS. The Platform Chassies Under Floats are weight bearing for assisting in the rising and lowering of the Platform Chassies, II. Fig: 1.3.

26. CROWN WHEEL. The Crown Wheel houses a Standard Ratchet and is mounted on and drives the Main Drive Shaft 10, Fig: 1.4. It meshes to and driven by the Worm Screw Head of the Vertical Drive Shaft 5. Fig: 2. The Ratchet will come into operation and free wheel should for any reason the rotary speed of the Section Vertical Drive Shaft 5 be retarded to that of the Main Drive Shaft, 10.

The Ratchet will also operate should the need arise to isolate the Section from the Main Drive Shaft.

27. BEVEL GEAR WHEEL. This Gear Wheel is the power take off from the Main Drive Shaft, 10, Fig: 1.4 for driving the Clutches 28, Fig: 4 which when engaged will activate the mechanism and the Main Chain, 32, Fig: 4 for synchronized rotation of the Vertical Worm Screw Shafts, 3, Fig: 2.3 for the rise and lowering of the Platform Chassies II, Fig: 1.3

28. CLUTCH UNITS. The Clutch Units with their pinions, discs and Gear Wheels, will independently be engaged as determined by the Tidal Water Height Sensor, 23, Fig: 3.5 influence on the Vertical Shaft 7, Fig: 3.5. It's influence on the Vertical Shaft 7, Fig: 3.5 will engage either of the two Clutches for forward or reverse rotation of the lifting and lowering mechanism.

29. SHAFTS AND GEAR WHEELS. The Toothed Gear Wheels are meshed to the Clutch Gear Wheels, 28, Fig: 4 and will rotate the Shaft and Sprocket for driving the Main Chain 32, Fig: 4. Rotation of same determined by which Clutch is engaged.

30. CHAIN SPROCKET. The Main Chain Driving Sprocket, this will rotate when either of the Clutches, 28, Fig: 4 are engaged and will drive the Main Chain for the rising and lowering mechanism.

31. SHAFTS AND SPROCKETS. The Sprockets are driven by the Main Chain, 32, Fig:4 and the Shafts with their Worm Screw Sleeve ends will drive and rotate the Crown Wheel Heads of the Vertical Worm Screw Shafts, 3, Fig: 2.3.

32. CHAIN. The Chain extends to and drives all the sprockets and Shafts that transfers the drive for instantaneous synchronous rotation of all the Vertical Worm Screw Shafts, 3. Fig: 2.3 as to create equivalent lift on all Worm Screw Boxes, 8. Fig: 3 in the uprights of the Platform Chassies, II Fig: 1.3. The Chain will be enclosed in a Chain case and the necessary tension and guide wheels used but not shown on drawings.

33. CONTROL GEAR. The Control Gear is attached to the Height Sensor Control Shaft, 7. Fig: 3.4 and will engage either of the two Clutches 28. Fig: 4 as determined by the Water Height Sensor Float, 23. Fig: 3 influence on the Height Control Shaft, 7. Fig: 3.4.

34. CROWN WHEEL. The Crown Wheel houses a Standard ratchet, and is meshed to and driven by the Wind Rotor reduction Gear Wheel Hub Worm Screw Shaft, 52. Fig: 13. This receives the contribution Energy of the Wind Rotor. Should the Wind Rotor speed drop lower than that of the speed of the Main Drive Shaft, 10. Fig: 1.4 the Ratchet will free wheel and will not impeed the drive of the Main Shaft. Also operate should it be necessary to disengage the drive from the Wind Rotor.

35. ROTOR CYLINDER BODY. The Vertical Cylinder Body carries the swivel hinged Wind Interrupting Vanes, 37. Fig: 13.14 the Cylinder Body is so shaped that when the Vanes are closed they are hidden in their insulated recesses showing only smoothe frictionless surface. The Rotor is carried and rotates on its Top and Bottom Bearings which are housed in the Main Framework, 58. Fig: 13.

36. BEARINGS. Top and Bottom Bearings, for the Rotor Cylinder Body, 35 housed in the Rotor Main Frame Work, 58. Fig. 13.

37. VANES. The Wind Interupting Vanes are hinge mounted on to the Rotor Vertical Cylinder Body, 35. Fig: 13.14 with their own spindles and bearings. The Vanes will open when the Jockey Wheels 38. Fig: 14 are in contact and riding the adjustable offcentric Cylinder Cam, 44. Fig.

13.14 and they are closed by their own returning Springs 39, Fig: 14 as soon as permitted by the Cylinder Cam 44. When closed on their return cycle towards the Wind Flow position they are closed in their respective insulated recesses, showing only smooth frictionless resistance free surface. Therefore the Rotor responding to the full benefit of the Wind force.

38. JOCKEY WHEELS. The Wheels are fixed to the Vanes curved angle elbows, and will act and open and close the Vanes, 37. Fig: 14 as influenced by the setting of the Cylinder Cam, 44. Fig: 13.14.

39. SPRINGS. The Springs will return and close the Vanes 37 to their recessed closed positions, as timed by the influence of the Cylinder Cam 44. Fig: 13.14 on the Jockey Wheel 38.14.

40. BUFFERS. The Buffers act as Spring 38 end retainer cups and Vanes, 37 opening, shock absorber stops.

41. SPINDLES. The Spindles are the swivel hinge mechanism attachment of the Wind Interrupting Vanes, 37 to the Rotor Vertical Cylinder Body, 35. Fig: 13.14.

42. CENTRE TUBELAR POST. The Centre Tubelar Post swivels on its own top and bottom bearings. The bearings which are housed in the Rotor Main Frame 58. Fig: 13. It carries items:- 43, 44, 45, 46 47 and 48. The Post towers high above the Rotor Main Frame 58 and on its top uppermost section it carries the wind directional Vee Vane, 48. Fig: 13 this will always direct the Post with its mounted item Cylinder Cam. 44 Fig: 13.14 to the precise position for the opening of the Wind Vanes 37. Fig: 13.14 in relation to the Wind direction.

43. SLEEVE GUIDES and SHAFTS. The Sleeve Guides are attached horizontally astride of the Centre Tubelar Post, 42. Fig: 13. Whilst the Shafts are telescopic sliding through the Sleeves. The Shaft ends are attached to the Cylinder Cam, 44. Fig: 13.14 at both ends, so actually the Cylinder Cam, 44 is carried by the Shafts and Sleeves and can move backwards and forwards by means of Shafts sliding through the Sleeves. The movement and degree of setting of the Cylinder Cam, 44, is achieved by the Worm Screw Shafts, 45. Fig: 13.14 wound through the Crown Wheels 47. Fig: 13 which are manual adjusted and set by the Vertical Control Shaft 46. Fig: 13 and Crown Wheel, 57. Fig: 13.

44. CYLINDER CAM. The Cylinder is mounted on the Centre Tubelar Post 42, by means of the Sleeve Guides and Shafts, 43. Fig: 13. The Cylinder Cam is adjustable horizontally from centre position to off centric position by means of its mounting horizontal Shafts sliding through the Sleeves, as determined by the rotary action of the Worm Screw Shafts 45, Fig: 13. When adjusting to the off centre position, the degree of opening of the Wind Vanes 37 can be gauged and determined, by the adjuster.

45. WORM SCREW SHAFTS. The Worm Screw Shafts are threaded through the centre hubs of the Crown Wheels, 47. Fig. 13 and each end will swivel in its bearing holder on the Cylinder Cam inner wall. The Worm Screw Shafts will move forward or backwards in response to the rotating of the Crown Wheels 47. Fig: 13.14. Hence the setting of the Cylinder

Cam, 44 to the degree of opening required of the Wind Vanes, 37, Fig: 13.14.

46. VERTICAL CONTROL SHAFT. The Vertical Control Shaft extends from the Control Wheel 57, Fig: 13 through the Centre Tubelar Post, 42. Fig: 13. It revolves on its own bearings which are housed in the Tubelar Post, 42. Fig: 13. Its Worm Screw Sleeves are fixed to the Shaft to correspond with the meshing of the Crown Wheels, 47. Fig: 13.14. The Shaft is manually controlled by its Control Wheel, 57. Fig: 13. On rotating the Shaft the attached worm screw sleeves will rotate the Crown Wheels, 47. Fig: 13.14 which will winde through the Worm Screw Shafts, 45. Fig: 13.14 moving the Cylinder Cam Body 44. Fig: 13.14 to the off centre position for full Vane, 37, opening, or to the degree of Vane, opening required. On reversing the rotation of the Control Shaft it will winde back the Cylinder Cam 44. Fig: 13.14 to the centre position, and all Vanes 37 will be in their closed position. In this position the Brake Plunger would have wound down on its thread and engaged the braking mechanism, bringing the Rotor to a halt.

47. CROWN WHEELS. The Crown Wheels are mounted in side the Centre Tubelar Post, 42. Fig: 13 and are meshing with the worm screw sleeves which are attched to the Vertical Control Shaft, 46. Fig: 13. Their worm screw sleeve hubs are mated with the Worm Screw Shafts 45 so when rotated by the Vertical Control Shaft, they will winde through the Worm Screw Shafts moving the Cylinder Cam in either direction as required.

48. VEE VANE. The Wind directional Vee Vane, is mounted on the uppermost part of the Centre Post, 42. Fig: 13.12. The Vee Vane will continually direct itself into the wind and by doing so, will rotate the Centre Post, 42 with its mounted Cylinder Cam 44 to the correct position for the wind interrupting Vanes 37 to open at the precise position, to interupt the main force of the wind. The one wing of the Vee Vane is adjustable for off setting to counteract the torque effect caused by the Jockey Wheels, 38. Fig: 13 rotary effect on the Cylinder Cam, 44. Fig: 13.14.

49. BEARINGS. The Top and Bottom Bearings for the Centre Tubelar Post 42, Fig: 13 are housed in the Rotor Main Frame 58. Fig: 13.12.

50. BEARINGS. The Bearings for the Vertical Control Shaft with its Worm Screw Sleeves 46. Fig: 13 are housed internally in the Centre Tubelar Post, 42. Fig: 13.

51. ROTOR DRIVE GEAR WHEEL. This is the power take off point of the Wind Rotor. It is meshed to and drives the Reduction Gear 52. Fig: 13 for the transfer of the rotary power to the Crown Wheel 34. Fig: 4 on the Main Drive Shaft, 10. Fig: 1.4.

52. REDUCTION GEAR WHEEL. This Gear Wheel is meshed to and driven by the Rotor Drive Gear Wheel, 51. Fig: 13. It's worm screw hub shaft is meshed to and drives the Crown Wheel Ratchet 34. Fig. 4 on the Section Main Shaft, 10. Fig: 1.4. Hence the Wind Rotor energy contribution to the main Sea energy power.

53. BRAKE ENGAGE PLUNGER. The Brake plunger is threaded internally to mate with the threaded Vertical Control Shaft, 46. Fig: 13. The lowering of the Plunger on its thread is timed to coincide with the withdrawal of the CYLINDER Cam, 44. Fig: 13. When this is fully retracted to its centre position with the Wind Vanes, 37. Fig: 13.14 fully closed, the Plunger will have engaged the Braking Mechanism 54. Fig: 13 and bring the Rotor to a stand still.

54. BRAKE CABLE & MECHANISM. The Brake mechanism will only be activated when the Plunger 53. Fig: 13 is lowered, with the Wind Vanes, 37,. Fig: 13 fully closed. Only then the mechanism will function and close the brake pads on the Rotor Braking Disc, 55. Fig. 13.

55. BRAKE DISC. The Brake Disc is attached to the base of the Rotor Cylinder Body, 35. Fig: 13. It will only come into use when the Rotor is to be halted.

56. BEARINGS. These are for the Reduction Gear 52. Fig: 13 with its worm screw hub shaft.

57. CONTROL WHEEL. This is for the manual operating of the Control Shaft, 46, Fig: 13 which can adjust the movement of the Cylinder Cam 44 by rotating effect of the Worm Screw Sleeves on the Crown Wheels, 47 which can set the opening of the Wind Vanes 37. To the degree required, and also when fully retracted will enage the braking system.

58. WIND ROTOR MAIN FRAME. The Main Frame contains the Wind Rotor with its mechanism and houses the Bearings for the Rotor Cylinder Body, 35 and the Bearings for the Centre Tubelar Post, 42. Fig: 13. The Main Frame is mounted on top of the Main Frame Structure, I. Fig: 1.12 when used in a combined effort with the Sea powered installation. If the Wind Rotor was to be used separately as a single unit on land, it would be mounted on a Structural Tower.

Reference to the Accompanying Drawings.

Drawings not drawn to scale, nor any part of drawing in proportional scale to another.

Sheet 1 Fig: 1 — Showing outline sketch of side view of the Main Frame Structure 1 mounted on Piles 2, Cradling the Platform Chassies 11 in its Channeld Uprights, showing position of Horizontal Shafts 10, 18R & 18L, Multi Ratio Ratchet Units, and the Arm Levers 13 with Ball Floats 12.

Sheet 2 Fig: 2 — Showing Main Frame Structure SECTION End View, with the Vertical Drive Shaft 5 with its Worm Screw Head, and Crown Wheel Sleeve 21 and the end pair of Vertical Worm Screw Shafts 3 with their Crown Wheel Heads, The Cross member of the Platform Chassies with its Roller Guides 24 in their channeld uprights, and position of the dual side Arm Levers 13, with the Ball Floats 12, in relation to the Sections Main Frame Structure 1.

Sheet 3 Fig: 3 — Showing a few of a Sections Vertical Worm Screw Shafts 3 with their Crown Wheel Heads, the Shafts threaded through the Female Worm Screw Boxes 8 in the Platform Chassies Uprights 11, in relation to the outline of the Main Frame Structure, also showing the Water Level Sensor Cage 23 and its Vertical Control Shaft 7 as situated in relation to the Platform Chassies 11, with its Under Floats 25, and the Main Frame Structure 1.

Sheet 4 Fig: 4 — An aerial view of a Section overhead Main Drive Shaft 10 with its mounted Crown Wheel 26 and 34, which are recipient of the Sea Energy Rotary Drive, and the recipient of the Wind Rotor Energy Drive, and the Bevel Gear Wheel 27 which is Rotated by the main Shaft 10 for driving the Clutches 28 for engaging the drive to the Main Chain 32 for distribution of rotary drive to the lifting and lowering mechanism.

Sheet 5
- A Showing the Water Level Sensor Unit 23 with its through Vertical Control Shaft 7 with the Ball Float in its mid: neutral position.
- B Showing the Sensor Ball Float with its protruding Roller Lugs, with the through Vertical Control Shaft 7 with its stop end float Bearings.
- C The Ball Float showing its shaped centre through channel for match mating with the Vertical Control Shaft 7.

Sheet 6 Fig: 6 — Showing section of M.R. Ratchet Unit Housing, Primary and Secondary Gears, with Arm Lever and Ball Float on its swivel bearings.

Sheet 7 Fig: 7 — Showing section of M.R. Ratchet Unit as positioned in their Housing the Multi Pawl Lever Ratchet Gear Wheel 17 on the Secondary drive shaft 18 on its bearings and seals, the Primary Gear Wheel 16 mounted on the Stub Axle 14 as mounted on the Housing Bearings and seals and also showing as mounted on the "A" Frame Bearings, the Arm Levers 13 as attached to the Stub Axles 14, and extending beyond its Axle Fulcrum for

counter weight, or tension spring to counter balance forward weight of the Arm Lever 13 and Ball Float 12.
The extending part of the Arm Lever 13, not shown on drawings.

Sheet 8 A Showing Internal section of Multi Pawl Lever Ratchet 17 with the off set positions of the oposed pairs of Levers in relation to the other pairs engagable position.

B Showing a sectional view of the Ratchet as mounted on the Secondary Drive Shaft 18 on their Bearings and Seals on the M.R. Ratchet Unit Housing.

Sheet 9
Fig: 9 Showing internal view of the Standard Ratchet of Gear Wheel 19 which is mounted and driven by the Secondary Shaft 18.

Fig: 10 Showing Intermediate Gear 20 with its Worm Screw Hub Shaft.

Fig: 11 Showing the Crown Wheel Sleeve 21 the Sleeve through channel shaped to match its driven Vertical Drive Shaft 5.

Sheet 10
Fig: 12 Showing outline view of Wind Rotor as mounted on upper deck of a Section Main Frame Structure.

Sheet 11
Fig: 13 Showing the Wind Rotor Unit, the cutaway section showing the Rotor internal mechanism, the Centre Tubelar Post 42 with its internal Control Shaft 46 with the Worm Screw Sleeves meshing to the Crown Wheels with their Worm Screw Shafts threaded through their worm Screw Hubs for moving the adjustable Cylinder Cam 44 from its Centre, the Rotor stationary position, to the off centre position for Vane 37 opening for interupting the Wind Force, the Cylinder Cam 44 as shown carried by its attached Shafts 43 sliding through their carrier Sleeves. The rotor centralized and carried by its top and Bottom Bearings 36 as shown in the Rotor unit Frame Structure 58. The Wind directional Vee Vane 48 as shown uppermost above the Rotor Main Frame 58.

Sheet 12
fig: 14 Showing aerial view of Rotor,35 the Wind interupting Vanes 37 in open position as the Jockey Wheels 38 are riding the off centre positioned Cylinder Cam 44, and in closed position once the Jockey Wheels 38 have left the influence of the Cylinder Cam 44.
Also showing the Cylinder Cam carrier Shafts 43 and the Cylinder Cam Worm screw adjuster 45.
All wind interupting Vanes 37 are returned to the closed position by their own returning Springs, (few springs only shown on drawings).

CLAIMS

1. The invention is probably unique, in the sense that it is designed to capture and harness both Elements of the Wind and Sea, and to convert same to Rotary Energy, it will respond automatically, rising and lowering its partially floating Platform, which carries all mechanism that requires to be lifted and lowered to maintain a certain functioning height above the variable Tidal Water Level, the items are as claimed in the following Claims 2 to 8.

2. Harnessing and utilize the upward thrust action of Ball Floats in response to their floating movement on the Waves and Swells and any undulation of the Sea surface and convey by Arm Levers to the Multi Ratio Ratchet Units and converted to Rotary Energy, as claimed in Claim 1.

3. The Ball Floats are designed to swivel and or rotate on the Arm Levers, this is to minimise any floatal side thrust, and also to vary the Ball Floats surfaces, of that exposed to the Air, and that immersed under Water:- as claimed in Claim 2.

4. The Multi Ratio, Multi Pawl Lever Ratchet Units make the device functional, (where an ordinary standard Ratchet would require a massive upward lift of the Ball Float to attain but very little semi rotary effect on the driven shafts). With the present Invention the minimal upward lift of the Ball Floats will have a considerable rotary action effect on the driven shafts. The Multi Pawl Lever Ratchet with its staggered positioned opposed pairs of Pawl Levers, will always have one pair of Levers engagable. This is designed to eliminate any wastage of traverse of the Pawl Levers before meshing. It also enables a sturdy toothed Ratchet to respond and perform like a fine toothed Ratchet. Hence the least upward thrust of the Ball Floats is positively transmitted through the Multi Ratio Ratchet Units and converted to have considerable rotary effect on the driven shafts:- as claimed in Claims 2.

5. In order to maintain the correct height above the variable Tidal Water Level for the Arm Levers with the Ball Floats to be at their best angle to develop their maximum upward thrust at all times. They are mounted and carried on a Platform, (which has been referred to as the Platform Chassies in all previous references). The Platform which is partially buoyant being supported by its Under Floats, and guided for its up and down movement by Roller or Wheel Guides travelling in the Channeled uprights of the Section Main Frame Structure, The Platform is held rigid from lowering nor elevating by the Vertical Worm Screw Shafts which are engaged through the female Worm Screw Boxes inserted in the Platform uprights. Only when the Water Level Sensor is activated by the rising or lowering of the Tidal Water Level will it engage by its Vertical Control Shaft one of the pair of Clutches Which in turn will engage the lifting mechanism into motion, which will instantaneously and synchronously revolve all the Vertical Worm Screw Shafts Which will winde their mated Worm Screw Boxes, to rise or lower on their Shafts and lift or lower the Platform to maintain the correct height for the best angle of the Arm Levers with the Ball Floats to function and achieve the maximum upward thrust movement in relation to the Water Level.

6. To maintain as claimed in Claims 1 and 5. In the present Invention there is a designed Tidal Water Height Sensor in the mode of a Vertical Cylindical Cage, housing a Ball Float. The Cage which is attached to the middle lower part of the Platform Chassies. When the Tidal Water rises the Sensor Ball Float from its mid: centre neutral position in the Cage. The Ball opposed protruding Roller Lugs will follow the channeled guides on the internal cylinder wall, and by doing so the Ball will be forced to semi rotate of up to 90 degrees. As the Ball Float centre through channel is enveloping and shape mated with the Vertical Control Shaft. It will slide up or down the shaft as required- and also force the Shaft to semi rotate. By doing so will engage one of the pair of Clutches which will activate the lifting mechanism into motion. Then the Platform will rise until the Sensor Ball Float and the Water Level finds its mid: neutral position in the Cage.
At ebbtide the Water Level will lower the Sensor Ball Float in its Cage and the Ball will follow the channeled guides and semi rotate in the opposite direction. By doing so will engage the alternate Clutch activating the lifting mechanism into a reverse rotation and lowering the Platform until the Water Level and Ball Float finds it mid: neutral position in the Cage. When the Sensor Ball Float is in its mid: neutral position in its Cage. This will always determine that the Platform is at its correct and best height in relations to the Water Level for the best functioning of the Arm Levers with the Ball Floats as claimed in Claims 5.

7. To unite the rotary energy contribution of the dual sides of the Platform, and to convert from the horizontal drive Shafts to the Vertical Driven Shaft and yet tolerate with the rising and lowering of the Platform without impeding the rotary drive. The intermediate gear wheels which are meshed to and driven by the Ratchet Gear Wheels mounted on the horizontal, Multi Ratio Ratchet driven Shafts. The intermediate Gear Wheels which are also meshed to each other for synchronous drive as their Worm Screw Hub Shafts are meshed to and drive the same one Crown Wheel Sleeve. The Sleeve envelopes and is shape mated with the Vertical Drive Shaft which will revolve with the Crown Wheel Sleeve. As the Vertical Drive Shaft has no end float movement therefore as the Platform rises or lowers itself the Crown Wheel Sleeve will travel up or down the Shaft whilst continuing its rotary drive unhindered.

8. The Invention has been designed so that no part of, nor a Section can impede the rotary drive of the over head Main Drive Shaft. As all rotary energy contributing mechanism is engaged to drive via a Standard Ratchet. Should any contributing section fail to maintain the revolving speed of the Main Drive Shaft the Ratchets will operate and free wheel. This is of significance as there are numerous Sections intended in a Site Installation. Connected in series in Tandem Formation or Multi Parallel Tandem Formation with the Sections over head Main Drive Shafts connected to each other by means of Telescopic Shafts linked to Universal Coulping and a Standard Ratchet, The universal Coupling and Telescopic Shafts will tolerate any misalignment that could develop between the Sections Main Frame Structures. Whilst the Ratchet will tolerate and correct any variation of the rotating speed between the Main Drive Shafts of any one Section and another.

9. The Wind Rotor, as claimed in Claim 1 is designed to make a contribution of its rotary Energy, and not entirely dependant on for the continuous rotary power output of the Section Main Drive Shaft. Should the wind speed vary and cause the Rotor drive shaft speed to be slower than that of the Section Main Drive Shaft, the Crown Wheel Ratchet will operate and freewheel, as claimed in Claim 8 and therefore will not impede the normal power output of the Section.

10. The Wind Rotor is a Unique Designed Unit, in the sense that the Vertical Cylinder Body carries all of the swivelling Wind Interrupting Vanes on its outer perimeter wall. Larger the circumference greater the number Vanes carried, and greater the leverage of force in relation to its axis. Designed that the influence of the Wind on the Wind Directional Vee Vane will position the Centre Tubelar Post which carries and directs the Cylinder Cam for the Wind Interrupting Vanes only to open at the precise position to interrupt the Main Force of the Wind, and once passed this position on their return cycle towards the Wind Force and their reopening position. They are closed in their respective insulated recesses on the Vertical Cylinder Body, Showing only smooth resistance free surface. Therefore the rotor responding to the full benefit of the Wind Force. The precise timing of the Vane opening is due to the positioned Vertical Centre Tubelar Post which Towers above the Rotor Main Frame Structure and on its top uppermost it carries the Wind Directional Vee Vane which will always direct itself into the main force of the Wind, Internal of the Rotor Cylinder Body the Centre Post carries the horizontaly adjustable, Cylinder Cam, which is adjustable from the centre position, the all Vanes closed position. To offcentre position to the degree of Vane opening required, the Vanes will open to the degree of lift the off centre Cylinder Cam will exert on the Vanes Jockey Wheels. The adjustment of the Cylinder Cam is controlled by the Vertical Control Shaft which extends through the Centre Tubelar Post. Its attached Worm Screw Sleeves are meshed to the Worm Screw Crown Wheels internal of the Centre Tubelar Post. As the Control Shaft is rotated its attached Worm Screw Sleeves will rotate the Crown Wheels, which in turn will winde through their Female Worm Screw Hubs the Worm Screw adjusting Shaft of the Cylinder Cam, moving the Cylinder Cam to the off centre position for Vane opening, or on reverse rotation of the Control Shaft, will winde the Cylinder Cam back to its centre position, where all Vanes will be in their closed position. At this position the brake plunger would have wound itself down the Control Shaft enagaging the Braking System.

11. The Sea Section Rotary Energy contribution, and the Wind Rotor Rotary Energy contribution, conveyed and united through Crown Wheel Ratchets to power drive the Sections over head Main Drive Shafts, which are connected in series or multi parallel series, as claimed in Claim 1 and 8 to accomplish a complete Power Site Installation.

12. The Sea Energy Powered Sections, though described in Claim 1 as a combined Unit, with the Wind Powered Unit, to harness both Elements, Sections of the Sea Power Mechanism as claimed in Claims 1 to 8 can be used independantly of the Wind Rotor Energy contribution. The Sea Energy Power Sections are probably unique as the only invented mechanised Construction that can cope fully automatically with the

Tidal Water Height variation:- as claimed in Claims 6

13. The Wind Rotor Power Unit, though described in Claim 1 as Combined Unit with the Sea Powered Sections, Can be used independently OF the Sea Powered Sections. If used on Land it would be mounted on a Constructed Tower. The Wind Rotor as claimed in Claims 9, 10 and 11 is unique in design, will probably prove to be the most efficient and powerful Wind Powered Unit yet designed.

Amendments to the claims have been filed as follows

(1) My claims are, For a Mechandized Constructed Framework, anchord to the Sea Bed. A device for utilizing the Natural Energy of the undulating Sea surface, and that of the Wind force. And to Convert, Transfer, and Unite, their Energy to Rotate and Power drive the "Section" Final Drive Main Shaft.

The Sea Power derived from the upthrust of Ball Floats, in response to their floating action on the Sea Swells, Waves, Ripples, and connected by Arm Levers to Multi Ratio, Multi Pawl Lever Ratchet Units, for convertion to Rotary drive of the Secondary Shafts.
The fore mentioned Ball Floats, Multi Ratchet Units, and Secondary Shafts mounted on dual side of a partially buoyant Platform Chassies. Which will automatically rise and lower itself in its guides to maintain its correct and best functional elevation, as determined by the Tidal Water Level Sensor Float of engaging the lifting and or lowering mechanism.

The Wind Rotor mounted overhead on the Main Frame Structure, captures the Wind Energy with its pivotally mounted Vanes on the outer perimeter wall of the Rotor Vertical Cylinder Body. The Vanes directionaly controlled for opening only when precisely positioned to obstruct the main force of the Wind. Its contributing Rotary Energy conveyed through to a Standard Ratchet Unit, to unite in the Power drive of the "Sections" Final Drive Main Shaft.

(2) A device as claimed in claims (1). The Sea Energy is captured from the upthrust of Ball Floats, which are mounted swivelling on Arm Levers. extending and attached to Stub Axles, where on is mounted the Primary Gear of the Multi Ratio Ratchet Unit, where the meshed driven Secondary Gear. of the Unit. houses the Multi Pawl Lever Ratchet. and mounted on to rotate drive the Secondary Shafts. The Unit deviced that the least upthrust of the Ball Floats is transmitted to have a considerable and positive Rotary effect on the driven Secondary Shafts.

(3) A device as claimed in Claims (1) and (2). The platform Chassies which carries on its dual sides, the mechanism as claimed in the fore mentioned claims, the Secondary Shafts, Multi Ratchet Units, Arm Levers with their attached swivelling Ball Floats. The said Platform Chassies is partially afloat due to its under Floats. The Platform uprights with their Roller Guides. is cradled and guided for its up and down movement in the channeled uprights of the Main Frame Structure. Though floatal, it is held rigid from rising or lowering by the Vertical Worm Screw Shafts, one in each of the channeled uprights of the Main Frame Structure. The said Vertical Worm Screw Shafts are threaded through the self centralizing Worm Screw Boxes. caged in the guided uprights of the Platform Chassies. The Platform Chassies with its mounted mechanism will only rise and or lower itself when the Vertical Worm Screw Shafts are Rotated, they will only be engaged for Rotating as and when determined by the Water Level Sensor Float, which will always respond to the variable Tidal Water height, and will always automatically maintain the Platform Chassies with its Mechanized mountings, at the correct and best elevation, for the maximum upthrust response from the Ball Floats.

(4) A device as claimed in claims (1). (2). and (3) The Tidal Water Height Sensor its Float caged and mounted on the Platform Chassies. The Float will always maintain its Nutral Position in the mid: centre position in its Cage at Water Level, the correct and best elevation for the Platform Chassies with its functional mounted equipment. When The Water level rises or lowers the Sensor

Float from its Nutral position in its Cage. The Float is guided and will semi: rotate, and as it is shape mated and enveloping the Vertical Control Shaft, the shaft will also semi: rotate, and by doing so will engage either one of a pair of Clutches, which in turn will engage the lifting and or lowering mechanism into motion and Rotate the Main Chain which will simultaneously and synchronously Rotate all Vertical Worm Screw Shafts, which will winde the Worm Screw Boxes up or down the Shafts, lifting or lowering the Platform Chassies as determined by the Water Level Sensor, The Lifting and Lowering Mechanism derives its Rotary Power from the "Section" Final Drive Main Shaft.

(5) A device as claimed in claimes (1). (2). (3). and (4) To Synchronize, Unite and Transfer, the Rotary Energy of the Secondary Shafts of the dual side of the Platform Chassies. to the Vertical Drive Shaft, for transfer of the Rotary Drive to the "Section" Overhead Final Drive Main Shaft. And to tolerate the rising and or lowering of the Platform Chassies without impeding the continuance of the Rotary Drive of the Vertical Drive Shaft.

The Standard Ratchets mounted on each of the Secondary Shafts, meshed to and drive a pair of intermediate Gear Wheels, which are meshed to each other for synchronization, as their Worm Screw Hubs are meshed to and drive the same one Crown Wheel Sleeve, which is shaped mated and enveloping the Vertical Drive Shaft. The said Crown Wheel Sleeve will travel up or down the Vertical Drive Shaft as required by the variable elevation of the Platform Chassies, whilst continue to drive the said Shaft.
The Standard Ratchet Units mounted on the Secondary Drive Shafts will operate and equalize if and when variation of their rotary speed occurs.

(6) A device as claimed in claims (1) The Wind Rotor Mounted overhead on the Main Frame Structure. Designed to receive, and respond to the full benefits of the prevailing Wind force. The Wind interrupting Vanes pivotally mounted on the outer perimeter wall of the Rotor Vertical Cylinder Body. The Vanes directionaly controlled, for opening only when precisely positioned to obstruct the main force of the Wind. Their opening position controlled by the influence of the Wind, on the Wind Directional Vee Vane, which will positioned the Center Tubelar Post which carries and directs the Cylinder Cam for the Wind Interrupting Vanes only to open at the precise position to interrupt the main Wind force. Once passed this position on their return cycle towards their reopening position. They are closed in their respective insulated recesses on the Vertical Cylinder Body, Showing only smoothe resistance free surface, therefor the Rotor responding to the full benefit of the Wind force. The presice timing of the Vanes opening is due to the positioned Vertical Centre Tubelar Post, which Towers above the Rotor Main Frame Structure, and on its top uppermost it carries the Wind directional Vee Vane which will always direct itself into the main force of the Wind. Internally of the Rotor Cylinder Body, the Centre Post carries the horizontally adjustable Cylinder Cam, which is adjustable from the centre position, 'The all Vanes closed position'. To the off-centre position to the degree of Vane opening required, to the degree of lift the off centre Cylinder Cam will exert on the Vanes Jockey Wheels.

The adjustment of the Cylinder Cam is controlled by the Vertical Control Shaft which extends vertically through the Centre Tubelar Post. The attached Worm Screw Sleeves are meshed to the Worm Screw Crown Wheels internal of the Centre Tubelar Post.

As the Control Shaft is rotated, its attached Worm Screw Sleeves will rotate their meshed Crown Wheels winding through their mated Female Worm Screw Hubs, the horizontally Worm Screw adjusting Shafts.of the Cylinder Cam, moving the Cylinder Cam to the off centre position, for Vane opening or on reverse rotation of the Control Shaft, it will winde the Cylinder Cam back to its centre position, where all Vanes will be in the closed position. At this position the Brake Plunger would have wound itself down the control shaft engaging the Braking System, bringing the Rotor to a halt.

The Rotary Energy contribution of the Wind Rotor conveyed and engaged to drive a Standard Rachet Unit, to unite in the Power Drive of the 'Section' Final Drive Main Shaft.

(7) A device as claimed in claims (1) to (7). The Sea and Wind Energies converted to Rotary Energy, their contribution engaged to drive their respective Standard Ratched Unit on each 'Section' Final Drive Main Shaft, Therefor no contributory factor can impede the Continuance Rotary Drive of the 'Section' Final Drive Main Shafts.

As designed and intended in a Site Installation of numerous 'Sections' in Tandem Formation, or Multi Parallel Tandem Formation, the Final Drive Main Shafts of all 'Sections' are connected by Telescopic Shafts, Universal Couplings, and Standard Ratchet Units. The Telescopic Shafts and Universal Couplings would tolerate any misalignment between the 'Sections' Main Frame Structures, whilst the Standard Ratchet Units will tolerate and equalize any variation of rotating speed between the Main Drive Shafts of one 'Section' and another.

(8) A Mechanized Constructed Framework, deviced to utilize the Natural Energy of the Undulating Sea Surface, and that of the Wind Force and to Convert, Transfer, and Unite their Energies to Rotary Power, for the purpose of Generating Electricity.

A device substantially as described herein, with reference to Figures 1 to 12 of the accompanying drawings.

Published 1990 at The Patent Office, State House, 66 71 High Holborn, London WC1R 4TP Further copies may be obtained from The Patent Office